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GALILEO GALILEI

AND THE ROMAN CURIA.

FROM AUTHENTIC SOURCES.

BY

KARL VON GEBLER.

TRANSLATED, WITH THE SANCTION OF THE AUTHOR, BY

MRS. GEORGE STURGE.

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LETTER TO THE TRANSLATOR.

MADAM,—

It is the desire of every author, every prosecutor of research, that the products of his labours, the results of his studies, should be widely circulated. This desire arises, especially in the case of one who has devoted himself to research, not only from a certain egotism which clings to us all, but from the wish that the laborious researches of years, often believed to refute old and generally-received errors, should become the common property of as many as possible.

The author of the present work is no exception to these general rules; and it therefore gives him great pleasure, and fills him with gratitude, that you, Madam, should have taken the trouble to translate the small results of his studies into the language of Newton, and thus have rendered them more accessible to the English nation.

But little more than two years have elapsed since the book first appeared in Germany, but this period has been a most important one for researches into the literature relating to Galileo.

In the year 1869 Professor Domenico Berti obtained permission to inspect and turn to account the Acts of Galileo's Trial carefully preserved in the Vatican, and in 1876 he published a portion of these important documents, which

essentially tended to complete the very partial publication of them by Henri de L'Epinois, in 1867. In 1877 M. de L'Epinois and the present writer were permitted to resuscitate the famous volume, which again lay buried among the secret papal archives; that is, to inspect it at leisure and to publish the contents in full. It was, however, not only of the greatest importance to become acquainted with the Vatican MS. as a whole, and by an exact publication of it to make it the common property of historical research; it was at least of equal moment to make a most careful examination of the material form and external appearance of the Acts. For the threefold system of paging had led some historians to make the boldest conjectures, and respecting one document in particular,—the famous note of 26th February, 1616,—there was an apparently well-founded suspicion that there had been a later falsification of the papers.

While, on the one hand, the knowledge gained of the entire contents of the Vatican MS., for the purpose of my own publication of it,[1] only confirmed, in many respects, my previous opinions on the memorable trial; on the other hand, a minute and repeated examination of the material evidence afforded by the suspicious document, which, up to that time, had been considered by myself and many other authors to be a forgery of a later date, convinced me, contrary to all expectation, that it indisputably originated in 1616.

This newly acquired experience, and the appearance of many valuable critical writings on the trial of Galileo since the year 1876, rendered therefore a partial revision and correction of the German edition of this work, for the English and an Italian translation, absolutely necessary. All the

[1] "Die Acten des Gallileischen Processes, nach der Vaticanischen Handschrift, von Karl von Gebler." Cotta, Stuttgard, 1877.

needful emendations have accordingly been made, with constant reference to the literature relating to the subject published between the spring of 1876 and the spring of 1878. I have also consulted several older works which had escaped my attention when the book was first written.

May the work then, in its to some extent new form, make its way in the British Isles, and meet with as friendly a reception there as the German edition has met with in Austria and Germany.

To you, Madam, I offer my warm thanks for the care with which you have executed the difficult and laborious task of translation.

Accept, Madam, the assurance of my sincere esteem.

KARL VON GEBLER.[1]

MERAN, 1*st April*, 1878.

[1] The above letter is adapted from a draft of one addressed to the Italian Translator, the letter to myself not having, unfortunately, been sent before the Author's death, nor found among his papers afterwards. He had written but a few weeks before that he would send it shortly, and as it would probably have been almost exactly similar to the above, I have availed myself of it, the Author's father having sent me a copy with the necessary alterations and authorised its use.—TR.

NOTE BY THE TRANSLATOR.

THE Vatican Manuscript alluded to in the foregoing letter, and constantly referred to in the text, was published by the author in the autumn of 1877, under the title of "Die Acten des Gallileischen Processes, nach der Vaticanischen Handschrift, von Karl von Gebler." Cotta, Stuttgard. This, with some introductory chapters, was intended to supersede the Appendix to the original work, and to form a second volume, when a new German edition should be called for. It did not, however, appear to me that any purpose would be served by reprinting all the Latin and Italian documents of the Vatican MS. in this country, as students who wish to consult them can easily procure them as published in the original languages in Germany, and I hope for a wider circle of readers than that composed exclusively of students. I therefore proposed to Herr von Gebler to give the History, Description, and Estimate of the Vat. MS., etc., in an Appendix, together with a few of the more important documents; to this, with some suggestions, as for instance, that some of the shorter documents should be given as notes to the text, he fully agreed, with the remark that I must know best what would suit my countrymen. The Appendix, therefore, differs somewhat both from the original Appendix and from the introductory

portions of the new volume, for these also were revised for the Translation.

The translations from Latin and Italian documents have been made from the originals by a competent scholar, and all the more important letters and extracts from letters of Galileo have been compared with the Italian. The Table of Contents, headings to and titles of the chapters, and Index, none of which exist in the original, have been added by myself.

JANE STURGE.

SYDENHAM, *November*, 1878.

BIOGRAPHICAL NOTICE OF THE AUTHOR.

ABRIDGED FROM THE "AUGSBURGER ALLGEMEINE ZEITUNG" OF 6th DECEMBER, 1878.

THE author of this work died at Gratz on the 7th of September, 1878. In devoting a few lines to his memory we have not a long and distinguished career to describe, for a brief span of life was all that was granted him, but to the last moment he sought to turn it to the best account.

The present work has enjoyed a wide circulation in Germany, but few of its readers could have known anything of the author but his name. The protracted studies which form the basis of it, the skilful handling of documentary material which seemed to betray the practised historian, must have suggested a man of ripe years, whose life had been passed in study, as the author; no one certainly would have sought him among the young officers of a cavalry regiment, whose tastes generally lie in any direction rather than that of historical research.

Karl von Gebler was the son of Field-marshal Wilhelm von Gebler, and was born at Vienna in 1850. Although early destined for the military career, he laid the foundations of a superior education in the grammar schools. Having passed through the gymnasium, in 1869 he joined the 7th regiment of the line as a private, and before long attained the rank of lieutenant in the 4th regiment of Dragoons. Being

an excellent draftsman and skilled in military surveying, he was often employed on the general's staff in drawing maps. In addition to his extensive knowledge of military affairs, he had many of the accomplishments befitting his calling; he was an excellent shot and a bold rider. But the duties of a cavalry officer were soon too limited for his active mind and intellectual tastes, and he sought also to win his spurs on the fields of literature. He occupied his leisure in translating the work of a French staff officer, "Success in War," to which he made some additions. He also published "The True Portrait of a Royal Hero of the 18th Century," in a newspaper; and finally, "Historic Sayings."

A night ride, undertaken in the performance of his official duties, from which he returned at daybreak to exercise at the riding school, brought on severe hemorrhage and inflammation of the lungs. The two physicians who attended him gave him up; in a consultation at his bedside, prudently held in Latin, they gave him twenty-four hours to live. One of them having taken leave, the other returned to the patient, who, with quiet humour, greeted him with the classic words, "Morituri te salutant!" The worthy doctor found, to his horror, that the patient had understood all that had passed, and had no easy task to persuade him that his case was not so bad after all. He had, however, in consequence of some local circumstances, already ordered the coffin.

Gebler's constitution surmounted the danger; by the spring he was able to join his parents at Gratz. But his health had sustained so severe a shock that he was compelled to abandon the military career. His parents removed to Gries, near Botzen, for the sake of a milder climate on his account. Here he revived wonderfully; he seemed to have taken a new lease of life, and devoted himself altogether to literary pursuits. The critical studies before mentioned of the assumed historic sayings of great men, and among them of Galileo's famous dictum, "E pur si muove," brought him into closer acquaintance with this hero of science. He accumulated so large a

material for a biographical sketch of the great Italian, that the limits of an essay seemed too narrow, and he resolved to undertake a more comprehensive work on the subject, which he thought would fill up a gap in German literature. In the autumn of 1875 the work, which had occupied him four years, was completed. It was not a little gratifying to the young author that one of the first publishers in Germany, Cotta, of Stuttgard, undertook the publication on very favourable terms, and brought it out in 1876. It met with great approval, and brought him into association with many eminent literary men in Italy and Germany. Galileo's own country was foremost in recognition of his services. The academies of Padua and Pisa, and the Accadémia dei Lincei sent him special acknowledgments, and King Victor Emmanuel rewarded him with the order of the Crown of Italy.

Before this work was finished he had removed with his father, having in the meanwhile lost his mother, to Meran, and during the first year of his residence there his health improved so much that he was able to take part in social life, and to enlarge the sphere of his labours and influence. Society in this little town owed much in many ways to the intellectual and amiable young officer. Whenever a good and noble cause required support, his co-operation might be reckoned on. In common with many other lovers of art and antiquity, he took a lively interest in the preservation and restoration of the Maultasch-Burg, which promises to be one of the chief sights of Meran. Unhappily he did not live to see the completion of the work.

With increase of health his zest for work increased also, and he addressed himself to a great historical task. The subject he selected was the Maid of Orleans. The preliminary studies were difficult in a place destitute of all aids to learning. His researches were not confined to the collection of all the printed material; in 1876 he had planned to search out the documentary sources wherever they were to be found, but before this he made close studies in the field of psychology and mental

pathology. The work of Ruf on the subject, the learned chaplain of a lunatic asylum, attracted his attention, and he entered into communication with the author. Ruf's great experience and philosophical acquirements were of great service to Gebler in his preliminary studies on Joan of Arc. But the project was not to be carried out. Just as he was about to write the second chapter, an essay of Berti's at Rome occasioned him to enter on fresh studies on Galileo.

Domenico Berti, who had examined the original Acts of Galileo's trial, though, as his work shows, very superficially, spoke contemptuously of the German *savans*, comparing them with blind men judging of colours, as none of them had seen the original Acts in the Vatican. This had special reference to the document of 26th February, 1616, which the German writers on the subject, and Gebler among them, declared to be a forgery. Being a man of the strictest love of truth, this reproach induced him, in spite of his health, which had again failed, in May, 1877, to go to Rome, where he obtained access to the Vatican. For ten weeks, in spite of the oppressive heat, he daily spent fourteen hours in the Papal Archives, studying and copying with diplomatic precision the original Acts of Galileo's trial. As the result of his labours, he felt constrained to declare the document in question to be genuine. Actuated only by the desire that truth should prevail, in the second part of his work, written at Rome, he without hesitation withdrew the opinion he had previously advocated as an error.

His first work had made a flattering commotion in the literary world, but the additional publication called forth a still more animated discussion of the whole question, which the readers of this journal will not have forgotten. Gebler took part in it himself, and, then suffering from illness, wrote his reply from a sick bed.

His sojourn in Rome had sadly pulled him down. On his return home, in July, 1877, he had lost his voice and was greatly reduced. But in October of the same year he once more roused himself for a journey to Italy. The object of the

previous one was to follow his hero in yellow and faded historic papers, but this time the task he had set himself was to pursue the tracks of Galileo in all the cities and places in any way connected with his memory. The result of these travels was an article in the *Deutsche Rundshau*, No. 7, 1878, "On the Tracks of Galileo." In this paper Gebler again dispels some clouds in which Galileo's previous biographers had enveloped him. We in these less romantic days are quite willing to dispense with the shudder at the stories of the dungeon, etc., and are glad to know that Galileo was permitted to enjoy a degree of comfort during his detention not often granted to those who come into collision with the world.

"On the Tracks of Galileo" was Gebler's last literary work. His strength of will and mental powers at length succumbed to his incurable malady. The mineral waters of Gleichenberg, which he had been recommended to try, did him more harm than good. He wrote thence to a friend, "I am in a pitiable condition, and have given up all hope of improvement." Unfortunately he was right. He had overtasked his strength. His zeal for science had hastened his end, and he may well be called one of her victims.

His last days were spent at Gratz, where his boyhood had been passed, and he rests beside his only brother. Both were the pride and joy of their father, now left alone.

In appearance Karl von Gebler was distinguished and attractive looking. No one could escape the charm of the freshness and originality of his mind, in spite of constant ill health. The refined young student, with the manners of a man of the world, was a phenomenon to his fellow-workers in the learned world. We have heard some of them say that they could not understand how Gebler could have acquired the historian's craft, the technical art of prosecuting research, without having had any special critical schooling.

The writer of these lines will never forget the hours spent with this amiable and, in spite of his success, truly modest young man in his snug study. The walls lined with books,

or adorned with weapons, betrayed at a glance the character and tastes of the occupant, while a pendulum clock dating from the time of Galileo recalled his work on the first observer of the vibrations of the pendulum to mind. He always liked to wind up the venerable timepiece himself, and took a pleasure in its sonorous tones. When I once more entered the study after his death, the clock had run down, the pendulum had ceased to vibrate, it told the hour no more.

PREFACE

TO THE GERMAN EDITION.

WHILE Italy and France possess an ample literature relating to Galileo, his oft-discussed fate and memorable achievements, very little has been written in Germany on this hero of science; and it would almost seem as if Copernicus and Kepler had cast the founder of mechanical physics into the shade. German literature does not possess one exhaustive work on Galileo. This is a great want, and to supply it would be a magnificent and thankworthy enterprise. It could only, however, be carried out by a comprehensive biography of the famous astronomer, which, together with a complete narrative of his life, should comprise a detailed description and estimate of his writings, inventions, and discoveries. We do not feel ourselves either called upon or competent to undertake so difficult a task. Our desire has been merely to fill up a portion of the gap in German literature by this contribution to the Life of Galileo, with a hope that it may be an incentive to some man of learning, whose studies qualify him for the task, to give our nation a complete description of the life and works of this great pioneer of the ideas of Copernicus.

We have also set ourselves another task; namely, to throw as much light as possible, by means of authentic documents, on the attitude Galileo assumed towards the Roman curia, and the history of the persecutions which resulted from it. To this end, however, it appeared absolutely necessary to give, at any rate in broad outline, a sketch of his aims and achievements as a whole. For his conflict with the ecclesiastical power was but the inevitable consequence of his subversive telescopic discoveries and scientific reforms. It was necessary to make the intimate connection between these causes and their historical results perfectly intelligible.

In the narration of historical events we have relied, as far as possible, upon authentic sources only. Among these are the following:—

1. Galileo's correspondence, and the correspondence relating to him between third persons. (Albèri's "Opere di Galileo Galilei." Vols. ii., iii., vi., vii., viii., ix., x., xv., and Suppl., in all 1,564 letters.)

2. The constant reports of Niccolini, the Tuscan ambassador at Rome, to his Government at Florence, during and after Galileo's trial. (Thirty-one despatches, from August 15th, 1632, to December 3rd, 1633.)

3. The Acts of the Trial, from the MS. originals in the Vatican.

4. The collection of documents published, in 1870, by Professor Silvestro Gherardi. Thirty-two extracts from the original protocols of the sittings and decrees of the Congregation of the Holy Office.[1]

5. Some important documents published by the Jesuit Father Riccioli, in his "Almagestum novum, Bononiæ, 1651."[2]

We have also been careful to acquaint ourselves with the

[1] See Appendix IV.

[2] Riccioli, vol. i. part ii. pp. 496–500.

numerous French and Italian Lives of Galileo, from the oldest, that of his contemporary, Gherardini, to the most recent and complete, that of Henri Martin, 1869; when admissible, we have cautiously used them, constantly comparing them with authentic sources. As the part of the story of Galileo of which we have treated is that which has been most frequently discussed in literature, and from the most widely differing points of view, it could not fail to be of great interest to us to collect and examine, as far as it lay in our power, the views, opinions, and criticisms to be found in various treatises on the subject. We offer our warm thanks to all the possessors of private, and custodians of public libraries, who have most liberally and obligingly aided us in our project.

One more remark remains to be made. Party interests and passions have, to a great extent, and with but few exceptions, guided the pens of those who have written on this chapter of Galileo's life. The one side has lauded him as an admirable martyr of science, and ascribed more cruelty to the Inquisition than it really inflicted on him; the other has thought proper to enter the lists as defender of the Inquisition, and to wash it white at Galileo's expense. Historical truth contradicts both.

Whatever may be the judgment passed on the present work, to one acknowledgment we think we may, with a good conscience, lay claim: that, standing in the service of truth alone, we have anxiously endeavoured to pursue none other than her sublime interests.

KARL VON GEBLER.

MERAN, *November*, 1875.

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PART I.

GALILEO'S EARLY YEARS, HIS IMPORTANT DISCOVERIES, AND FIRST CONFLICT WITH THE ROMAN CURIA.

CHAPTER I.

EARLY YEARS AND FIRST DISCOVERIES.

Birth at Pisa.—Parentage.—His Father's Writings on Music.—Galileo destined to be a Cloth Merchant.—Goes to the Convent of Vallombrosa.—Begins to study Medicine.—Goes to the University of Pisa.—Discovery of the Isochronism of the Pendulum.—Stolen Lessons in Mathematics.—His Hydrostatic Scales.—Professorship at Pisa.—Poor Pay.—The Laws of Motion.—John de' Medici.—Leaves Pisa.—Professorship at Padua.—Writes various Treatises.—The Thermoscope.—Letter to Kepler.—The Copernican System.—"De Revolutionibus Orbium Cœlestium."

THE same memorable day is marked by the setting of one of the most brilliant stars in the firmament of art and the rising of another in the sphere of science, which was to enlighten the world with beams of equal splendour. On the 18th February, 1564, Michael Angelo Buonarotti closed his eyes at Rome, and Galileo Galilei first saw the light at Pisa.

He was the son of the Florentine nobleman, Vincenzo Galilei, and of Julia, one of the ancient family of the Ammanati of Pescia, and was born in wedlock, as the documents of the church clearly attest.[1] His earliest years were spent at Pisa, but his parents soon returned to Florence, which was their settled home. Here he received his early education. His father had distinguished himself by his writings on the theory

[1] Compare Nelli, vol. i. pp. 24, 25, and Opere xv. p. 384. The strange mistake, which is without any foundation, that Galileo was an illegitimate child, was set afloat soon after his death by Johann Victor Rossi (Janus Nicius Erythræus) in his "Pinacotheca Illustrium Virorum," Cologne, Amsterdam, 1643–1648, and afterwards carelessly and sometimes maliciously repeated. Salviati has published the marriage certificate of 5th July, 1563, of Vincenzio di Michel Angelo di Giovanni Galilei and Giulia degli Ammanati Pescia.

of music, particularly the mathematical part of it.[1] They were not merely above mediocrity, but aimed at innovation, and if they did not achieve reform, it was to be attributed to the conservative spirit then reigning in Italy, which asserted itself in every department of life, and especially in the spheres of art and science.

Galileo's father had no property. His income was but scanty, and the fates had endowed him with a numerous family instead of with fortune.[2] Under these untoward circumstances he at first destined the little Galileo, as is related by Gherardini, his earliest biographer, to a career by no means distinguished, though advantageous in a material point of view, and one that conferred much of their wealth on the Florentines, so that it was held in high esteem—he was to be a cloth dealer. But the young noble first received the education befitting his station, that is, a very mediocre teacher instructed him in the Humanities.[3] Fortunately for the clever young scholar, he was handed over to the pious brethren of the convent of Vallombrosa for further education. Here he at once made rapid progress. He acquired great facility in the classics. His thorough study of the masterpieces of antiquity was of the greatest advantage to him. He doubtless thereby laid the foundation of the admirable style to which he afterwards, in some measure, owed his brilliant successes.

Galileo had a great variety of talent. Besides ardent pursuit of the solid branches of learning, he had considerable skill in drawing and music, in which he afterwards attained so much perfection that his judgment was highly esteemed, even

[1] Many of these essays, which have never been printed, are among the valuable unpublished MSS. in the National Library at Florence.

[2] Galileo had a younger brother, Michel Angelo, and three sisters, Virginia, Elenor, and Livia. The former married a certain Benedetto Landucci, the latter Taddeo Galètti. Galileo was very kind to his brother and sisters all his life, assisted them in many ways, and even made great sacrifices for their sakes.

[3] Nelli, vol. i. pp. 26, 27.

by great artists.[1] He played the lute himself with the skill of a master. He also highly appreciated poetry. His later essays on Dante, Orlando Furioso, and Gerusalemme Liberata, as well as the fragment of a play, bear witness to his lively interest in *belles lettres*. But from his earliest youth he showed the greatest preference for mechanics. He made little machines with an ingenuity and skill which evinced a really unusual talent for such things.[2]

With these abilities his father must soon have arrived at the conclusion that his son was born for something better than for distributing wool among the people, and resolved to devote him to science; only it was necessary that the branch of it to which he turned his attention should offer a prospect of profit. Medicine was decided on as the most likely to be lucrative, although it may not seem the one most suited to his abilities.

On 5th November, 1581, Galileo, then just seventeen, entered the University of Pisa.[3] Even here the young medical student's independent ideas and aims made way for themselves. At that time any original ideas and philosophical views not derived from the dogmas of Aristotle were unheard of. All the theories of natural science and philosophy had hitherto been referred to theology. It had been held to be the Alpha and Omega of all human knowledge. But now the period was far advanced in which it was felt to be necessary to cast off the narrow garments fashioned by religion, though at first the will to do so exceeded the power. A stir and ferment agitated men's minds. A period of storm and stress had begun for the study of nature and the philosophical speculation so closely connected with it. Men did not as yet possess energy and ability for direct advance, so they turned with real fanaticism to ancient learning, which, being

[1] Op. xv. (Viviani), p. 330; and Op. vi. p. 18.

[2] Op. xv. (Viviani), p. 328.

[3] The correctness of this date is indisputable, as according to Nelli, vol. i. p. 29, it was found in the university registers. It is a pity that Albèri, editor of the "Opere complete di Galileo Galilei," Florence, 1842-1856, relied for the date on Viviani, who is often wrong.

independent, and not based on religious notions, afforded them satisfaction. Under these circumstances recurrence to the past was real progress.

Unconditional surrender to the ideas of others, entire adoption of opinions, some of which were not too well verified, might suit mediocrity, but it could not suffice for the powerful mind of Galileo, who was striving to find out the truth for himself. The genius of the young student rebelled fiercely against rigid adherence to an antiquated standpoint. To the horror of the followers of Aristotle, who were quite taken aback at such unheard-of audacity, he resolutely attacked in public disputations many oracular dicta of their great master hitherto unquestioned, and this even then made him many enemies, and acquired for him the epithet of "the Wrangler."[1]

Two circumstances occur during Galileo's student years, which, in their main features, are not without historical foundation, although in detail they bear an anecdotal impress. One, which is characteristic of Galileo's observant eye, shows us the student of nineteen devoutly praying in the Cathedral at Pisa; but he seems to have soon wearied of this occupation, for he dreamily fixed his eye on the Maestro Possenti's beautiful lamp, hanging from an arch, which, in order to light it more readily, had been moved out of its vertical position and then left to itself. The oscillations were at first considerable, became gradually less and less, but notwithstanding the varying distances, they were all performed in the same time, as the young medical student discovered to a nicety by feeling his pulse. The isochronism of the vibrations of the pendulum was discovered![2]

The other story refers to Galileo's first mathematical studies. Gherardini relates that he was scarcely acquainted with the elements of mathematics up to his twentieth year, which, by the by, seems almost incredible. But while he was

[1] Op. xv. (Viviani), p. 331; also Jagemann, p. 5.

[2] Op. xv. (Viviani), p. 332; also Nelli, vol. ii. pp. 722, 723.

diligently studying medicine at Pisa, the court of Tuscany came there for some months. Among the suite was Ostilio Ricci, governor of the pages, a distinguished mathematician and an old friend of the Galilei family; Galileo, therefore, often visited him. One morning when he was there, Ricci was teaching the pages. Galileo stood shyly at the door of the schoolroom, listening attentively to the lesson; his interest grew greater and greater; he followed the demonstration of the mathematical propositions with bated breath. Strongly attracted by the science almost unknown to him before, as well as by Ricci's method of instruction, he often returned, but always unobserved, and, Euclid in hand, drank deeply, from his uncomfortable concealment, of the streams of fresh knowledge. Mathematics also occupied the greater part of his time in the solitude of his study. But all this did not satisfy his thirst for knowledge. He longed to be himself taught by Ricci. At last he took courage, and, hesitatingly confessing his sins of curiosity to the astonished tutor, he besought him to unveil to him the further mysteries of mathematics, to which Ricci at once consented.

When Galileo's father learnt that his son was devoting himself to Euclid at the expense of Hippocrates and Galen, he did his utmost to divert him from this new, and as it seemed to him, unprofitable study. The science of mathematics was not then held in much esteem, as it led to nothing practical. Its use, as applied to the laws of nature, had scarcely begun to be recognised. But the world-wide mission for which Galileo's genius destined him had been too imperiously marked out by fate for him to be held back by the mere will of any man. Old Vincenzo had to learn the unconquerable power of genius in young Galileo, and to submit to it. The son pursued the studies marked out for him by nature more zealously than ever, and at length obtained leave from his father to bid adieu to medicine and to devote himself exclusively to mathematics and physics.[1]

[1] Op. xv. (Viviani), p. 334.

The unexpected successes won by the young philosopher in a very short time in the realm of science, soon showed that his course had now been turned into the proper channel. Galileo's father, who, almost crushed with the burden of his family, could with difficulty bear the expense of his son's residence at the University, turned in his perplexity to the beneficence of the reigning Grand Duke, Ferdinand de' Medici, with the request that, in consideration of the distinguished talents and scientific attainments of Galileo, he would grant him one of the forty free places founded for poor students at the University. But even then there were many who were envious of Galileo in consequence of his unusual abilities and his rejection of the traditional authority of Aristotle. They succeeded in inducing the Grand Duke to refuse poor Vincenzo's petition, in consequence of which the young student had to leave the University, after four years' residence, without taking the doctor's degree.[1]

In spite of these disappointments, Galileo was not deterred, on his return home, from continuing his independent researches into natural phenomena. The most important invention of those times, to which he was led by the works of Archimedes, too little regarded during the Middle Ages, was his hydrostatic scales, about the construction and use of which he wrote a treatise, called "La Bilancetta." This, though afterwards circulated in manuscript copies among his followers and pupils, was not printed until after his death, *in* 1655.

Galileo now began to be everywhere spoken of in Italy. The discovery of the movement of the pendulum as a measurement of time, the importance of which was increasingly recognised, combined with his novel and intellectual treatment of physics, by which the phenomena of nature were submitted, as far as possible, to direct proof instead of to the *a priori* reasoning of the Aristotelians, excited much attention in all scientific circles. Distinguished men of learning, like

[1] Nelli, vol. i. pp. 32, 33.

Clavius at Rome, with whom he had become acquainted on his first visit there in 1587,[1] Michael Coignet at Antwerp, Riccoboni, the Marquis Guidubaldo del Monte, etc., entered into correspondence with him.[2] Intercourse with the latter, a distinguished mathematician, who took the warmest interest in Galileo's fate, became of the utmost importance to him. It was not merely that to his encouragement he owed the origin of his excellent treatise on the doctrine of centres of gravity, which materially contributed to establish his fame, and even gained for him from Del Monte the name of an "Archimedes of his time," but he first helped him to secure a settled and honourable position in life. By his opportune recommendation in 1589, the professorship of mathematics at the University of Pisa, just become vacant, was conferred on Galileo, with an income of sixty scudi.[3] It is indicative of the standing of the sciences in those days that, while the professor of medicine had a salary of two thousand scudi, the professor of mathematics had not quite thirty kreuzers[4] a day. Even for the sixteenth century it was very poor pay. Moreover, in accordance with the usage at the Italian Universities, he was only installed for three years; but in Galileo's needy circumstances, even this little help was very desirable, and his office enabled him to earn a considerable additional income by giving private lessons.

During the time of his professorship at Pisa he made his grand researches into the laws of gravitation, now known under the name of "Galileo's Laws," and wrote as the result of them his great treatise "De Motu Gravium." It then had but a limited circulation in copies, and did not appear in print until two hundred years after his death, in Albèri's "Opere complete di Galileo Galilei." Aristotle,

[1] That Galileo had been in Rome before 8th January, 1588, a fact hitherto unknown to his biographers, is clear from the letter of that date addressed from Florence to Clavius. (Op. vi. pp. 1–3.)

[2] See their letters to Galileo. (Op. viii. pp. 1–13.)

[3] About £13.—[TR.]

[4] About 7½*d.* 100 kreuzers = the Austrian florin.

nearly two thousand years before, had raised the statement to the rank of a proposition, that the rate at which a body falls depends on its weight. Up to Galileo's time this doctrine had been generally accepted as true, on the mere word of the old hero of science, although individual physicists, like Varchi in 1544, and Benedetti in 1563, had disputed it, maintaining that bodies of similar density and different weight fall from the same height in an equal space of time. They sought to prove the correctness of this statement by the most acute reasoning, but the idea of experiment did not occur to any one. Galileo, well aware that the touchstone of experiment would discover the vulnerable spot in Aristotelian infallibility, climbed the leaning tower of Pisa, in order thence to prove by experiment, to the discomfiture of the Peripatetic school, the truth of the axiom that the velocity with which a body falls does not depend on its weight but on its density.[1]

It might have been thought that his opponents would strike sail after this decisive argument. Aristotle, the master, would certainly have yielded to it—but his disciples had attained no such humility. They followed the bold experiments of the young professor with eyes askance and miserable sophistries, and, being unable to meet him with his own weapons of scientific research, they eagerly sought an opportunity of showing the impious and dangerous innovator the door of the *aula.*

An unforeseen circumstance came all at once to their aid in these designs. An illegitimate son of the half-brother of the reigning Grand Duke,—the relationship was somewhat farfetched, but none the less ominous for Galileo—John de' Medici, took an innocent pleasure in inventing machines, and considered himself a very skilful artificer. This ingenious semi-prince had constructed a monster machine for cleaning the harbour of Leghorn, and proposed that it should be brought into use. But Galileo, who had been commissioned to examine the marvel, declared it to be useless, and, un-

[1] Op. xv. (Viviani), p. 336; and Nelli, vol. i. p. 44.

fortunately, experiment fully confirmed the verdict. Ominous head-shakings were seen among the suite of the deeply mortified inventor. They entered into alliance with the Peripatetic philosophers against their common enemy. There were cabals at court. Galileo, perceiving that his position at Pisa was untenable, voluntarily resigned his professorship before the three years had expired, and migrated for the second time home to Florence.[1]

His situation was now worse than before, for about this time, 2nd July, 1591, his father died after a short illness, leaving his family in very narrow circumstances. In this distress the Marquis del Monte again appeared as a friend in need. Thanks to his warm recommendation to the Senate of the Republic of Venice, in the autumn of 1592 the professorship of mathematics at the University of Padua, which had become vacant, was bestowed on Galileo for six years.[2] On 7th December, 1592, he entered on his office with a brilliant opening address, which won the greatest admiration, not only for its profound scientific knowledge, but for its entrancing eloquence.[3] His lectures soon acquired further fame, and the number of his admirers and the audience who eagerly listened to his, in many respects, novel demonstrations, daily increased.

During his residence at Padua, Galileo displayed an extraordinary and versatile activity. He constructed various machines for the service of the republic, and wrote a number of excellent treatises, intended chiefly for his pupils.[4] Among the larger works may be mentioned his writings on the laws of motion, on fortification, gnomonics (the making of sundials), mechanics, and on the celestial globe, which attained a wide circulation even in copies, and were some of them printed

[1] Op. xv. (Viviani), pp. 336, 337; Nelli, vol. i. pp. 46, 47; Venturi, vol. i. p. 11.

[2] See the decree of installation of 26th Sept. (Op. xv. p. 388.)

[3] Op. viii. p. 18; Nelli, vol. i. p. 51.

[4] Op. xv. (Viviani), pp. 337 and 389.

long afterwards—the one on fortification not until the present century;[1] others, including the one on gnomonics, are unfortunately lost. On the wide field of inventions two may be specially mentioned, one of which was not fully developed until much later. The first was his proportional circle, which, though it had no special importance as illustrative of any principle, had a wide circulation from its various practical uses. Ten years later, in 1606, Galileo published an excellent didactic work on this subject, dedicated to Cosmo de' Medici, and in 1607 a polemical one against Balthasar Capra, of Milan, who, in a treatise published in 1607, which was nothing but a plagiarism of Galileo's work disfigured by blunders, gave himself out as the inventor of the instrument. Galileo's reply, in which he first exhibited the polemical dexterity afterwards so much dreaded, excited great attention even in lay circles from its masterly satire.[2] The other invention was a contrivance by which heat could be more exactly indicated. Over zealous biographers have therefore hastened to claim for their hero the invention of the thermometer, which, however, is not correct, as the instrument, which was not intended to measure the temperature, could not be logically called a thermometer, but a thermoscope, heat indicator. Undoubtedly it prepared the way by which improvers of the thermoscope arrived at the thermometer.[3]

Before proceeding further with Galileo's researches and discoveries, so far as they fall within our province, it seems important to acquaint ourselves with his views about the Copernican system. From a letter of his to Mazzoni, of 30th May, 1597,[4] it is clear that he considered the opinions of Pythagoras and Copernicus on the position and motion of the earth to be far more correct than those of Aristotle and Ptolemy. In another letter of 4th August of the same year

[1] Published by Venturi, 1818, vol. i. pp. 26–74.
[2] Op. xv. (Viviani), pp. 339, 340.
[3] Op. xv. (Viviani), pp. 337, 338.
[4] Op. ii. pp. 1–6.

to Kepler, he thanks him for his work, which he had sent him, on the Mysteries of the Universe,[1] and writes as follows about the Copernican system :—

"I count myself happy, in the search after truth, to have so great an ally as yourself, and one who is so great a friend of the truth itself. It is really pitiful that there are so few who seek truth, and who do not pursue a perverse method of philosophising. But this is not the place to mourn over the miseries of our times, but to congratulate you on your splendid discoveries in confirmation of truth. I shall read your book to the end, sure of finding much that is excellent in it. I shall do so with the more pleasure, because *I have been for many years an adherent of the Copernican system*, and it explains to me the causes of many of the appearances of nature which are quite unintelligible on the commonly accepted hypothesis. *I have collected many arguments for the purpose of refuting the latter;* but I do not venture to bring them to the light of publicity, for fear of sharing the fate of our master, Copernicus, who, although he has earned immortal fame with some, yet with very many (so great is the number of fools) has become an object of ridicule and scorn. I should certainly venture to publish my speculations if there were more people like you. But this not being the case, I refrain from such an undertaking."[2]

In an answer from Grätz, of 13th October of the same year, Kepler urgently begs him to publish his researches into the Copernican system, advising him to bring them out in Germany if he does not receive permission to do so in Italy.[3] In spite of this pressing request of his eminent friend, however, Galileo was not to be induced to bring his convictions to the light yet, a hesitation which may not appear very commendable. But if we consider the existing state of science, which condemned the Copernican system as an unheard of and fantastic hypothesis, and the religious incubus which weighed down all knowledge of nature irrespective of religious belief, and if, besides all this, we remember the entire revolution in the sphere both of religion and science involved in the reception of the Copernican system, we shall be more ready to admit that Galileo had good reason to be cautious. The Coperni-

[1] "Prodromus Dissertationum Cosmographicarum."

[2] Op. vi. pp. 11, 12.

[3] Op. viii. pp. 21–24.

can cause could not be served by mere partisanship, but only by independent fresh researches to prove its correctness, indeed its irrefragability. Nothing but the fulfilment of these conditions formed a justification, either in a scientific or moral point of view, for taking part in overturning the previous views of the universe.

Before the powerful mind of Copernicus ventured to question it, our earth was held to be the centre of the universe, and about it all the rest of the heavenly bodies revolved. There was but one "world," and that was our earth; the whole firmament, infinity, was the fitting frame to the picture, upon which man, as the most perfect being, held a position which was truly sublime. It was an elevating thought that you were on the centre, the only fixed point amidst countless revolving orbs! The narrations in the Bible, and the character of the Christian religion as a whole, fitted this conception exceedingly well; or, more properly speaking, were made to fit it. The creation of man, his fall, the flood, and our second venerable ancestor, Noah, with his ark in which the continuation of races was provided for, the foundation of the Christian religion, the work of redemption;—all this could only lay claim to universal importance so long as the earth was the centre of the universe, the only world. Then all at once a learned man makes the annihilating assertion that our world was not the centre of the universe, but revolved itself, was but an insignificant part of the vast, immeasurable system of worlds. What had become of the favoured status of the earth? And this indefinite number of bodies, equally favoured by nature, were they also the abodes of men? The bare possibility of a number of inhabited worlds could but imperil the first principles of Christian philosophy.

The system of the great Copernicus, however, thanks to the anonymous preface to his famous work, "De Revolutionibus Orbium Cœlestium," had not, up to this time, assumed to be a correct theory, but only a hypothesis, which need not be considered even probable, as it was only intended to facilitate

astronomical calculations. We know now that this was a gigantic mistake, that the immortal astronomer had aimed at rectifying the Ptolemaic confusion, and was fully convinced of the correctness of his system; we know that this unprincipled Introduction is by no means to be attributed to Copernicus, but to Andreas Osiander, who took part in publishing this book, which formed so great an epoch in science, and whose anxious soul thereby desired to appease the anticipated wrath of the theologians and philosophers. And we know further that the founder of our present system of the universe, although he handled the first finished copy of his imperishable work when he was dying, was unable to look into it, being already struck by paralysis, and thus never knew of Osiander's weak-minded Introduction, which had prudently not been submitted to him.[1]

A few days after receiving a copy of the great work of his genius, Copernicus died, on 24th May, 1543; and his system, for which he had been labouring and striving all his life, was, in consequence of Osiander's sacrilegious act, reduced to a simple hypothesis intended to simplify astronomical calculations! As such it did not in the least endanger the faith of the Church. Even Pope Paul III., to whom Copernicus had dedicated his work, received it "with pleasure." In 1566 a second edition appeared at Basle, and still it did not excite any opposition from the Church. It was not till 1616, when it had met with wide acceptance among the learned, when its correctness had been confirmed by fresh facts, and it had begun to be looked upon as true, that the Roman curia felt moved to condemn the work of Copernicus until it had been corrected (*donec corrigantur*).

Having thus rapidly glanced at the opposition between the Copernican system and the Ptolemaic, which forms the prelude to Galileo's subsequent relations with Rome, we are at liberty to fulfil the task we have set ourselves, namely, to portray "Galileo and the Roman Curia."

[1] See Humboldt's "Cosmos," vol. ii. pp. 345, 346, and 497-499.

CHAPTER II.

THE TELESCOPE AND ITS REVELATIONS.

Term of Professorship at Padua renewed.—Astronomy.—A New Star.—The Telescope.—Galileo not the Inventor.—Visit to Venice to exhibit it.—Telescopic Discoveries.—Jupiter's Moons.—Request of Henry IV.—"Sidereus Nuncius."—The Storm it raised.—Magini's attack on Galileo.—The Ring of Saturn.—An Anagram.—Opposition of the Aristotelian School.—Letter to Képler.

THE first six years of Galileo's professorship at Padua had passed away, but the senate were eager to retain so bright a light for their University, and prolonged the appointment of the professor, whose renown was now great, for another six years, with a considerable increase of salary.[1]

As we have seen, he had for a long time renounced the prevailing views about the universe; but up to this time he had discussed only physical mathematical questions with the Peripatetic school, the subject of astronomy had not been moot. But the sudden appearance of a new star in the constellation of Serpentarius, in October, 1604, which, after exhibiting various colours for a year and a half, as suddenly disappeared, induced him openly to attack one of the Aristotelian doctrines hitherto held most sacred, that of the unchangeableness of the heavens. Galileo demonstrated, in three lectures to a numerous audience, that this star was neither a mere meteor, nor yet a heavenly body which had before existed but had only now been observed, but a body which had recently appeared and had again vanished.[2] The subject,

[1] Op. xv. p. 390. His salary at first was 72 Florentine zecchini=£18, and rose by degrees to 400 zecchini=£100. (Op. viii. p. 18, note 3.)

[2] Some fragments of these lectures are extant, and are included by Albèri in the Op. v. part ii.

though not immediately connected with the Copernican question, was an important step taken on the dangerous and rarely trodden path of knowledge of nature, uninfluenced by dogmatism or petrified professorial wisdom. This inviolability of the vault of heaven was also conditioned by the prevailing views of the universe. What wonder then that most of the professors who had grown grey in the Aristotelian doctrine (Cremonio for instance, Coressio, Lodovico delle Colombo, and Balthasar Capra) were incensed at these opinions of Galileo, so opposed to all their scientific prepossessions, and vehemently controverted them.

The spark, however, which was to set fire to the abundant inflammable material, and to turn the scientific and religious world, in which doubt had before been glimmering, into a veritable volcano, the spark which kindled Galileo's genius and made him for a long time the centre of that period of storm and stress, was the discovery of the telescope.

We will not claim for Galileo, as many of his biographers have erroneously done, priority in the construction of the telescope. We rely far more on Galileo's own statements than on those of his eulogists, who aim at effect. Galileo relates with perfect simplicity at the beginning of the "Sidereus Nuncius," published at Venice in 1610, that he had heard about ten months ago that an instrument had been made by a Dutchman, by means of which distant objects were brought nearer and could be seen very plainly. The confirmation of the report by one of his former pupils, a French nobleman, Jean Badovere of Paris, had induced him to reflect upon the means by which such an effect could be produced. By the laws of refraction he soon attained his end. With two glasses fixed at the ends of a leaden tube, both having one side flat and the other side of the one being concave and of the other convex, his primitive telescope, which made objects appear three times nearer and nine times larger, was constructed. But now, having "spared neither expense nor labour," he had got so far as to construct an instrument which magnified an object

nearly a thousand times, and brought it more than thirty times nearer.[1] Although, therefore, it is clear from this that the first idea of the telescope does not belong to Galileo, it is equally clear that he found out how to construct it from his own reflection and experiments. Undoubtedly also the merit of having made great improvements in it belongs to him, which is shown by the fact that at that time, and long afterwards, his telescopes were the most sought after, and that he received numerous orders for them from learned men, princes and governments in distant lands, Holland, the birth-place of the telescope, not excepted.[2] But the idea which first gave to the instrument its scientific importance, the application of it to astronomical observations, belongs not t the original inventor but to the genius of Galileo. Thi alone would have made his name immortal.[3]

A few days after he had constructed his instrument, im- perfect as it doubtless was, he hastened with it to Venice, having received an invitation, to exhibit it to the doge and senate, for he at once recognised its importance, if not to the full extent. We will now let Galileo speak for himself in a letter which he wrote from Venice to his brother-in-law, Benedetto Landucci:—

"You must know then that about two months ago a report was spread here that in Flanders a spy-glass had been presented to Prince Maurice, so ingeniously constructed that it made the most distant objects appear quite near, so that a man could be seen quite plainly at a distance of two *miglia*. This result seemed to me so extraordinary that it set me thinking;

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[1] Op. iii. ("Astronomicus Nuncius," pp. 60, 61.) In his "Saggiatore" also he relates the circumstance in precisely the same way, only adding that he devised the construction of the telescope in one night, and carried it out the next day.

[2] Nelli, pp. 186, 187.

[3] History has acknowledged the optician Hans Lipperhey, of Middelburg, to be the inventor of the telescope. Compare the historical sketch in "Das neue Buch der Erfindungen," etc., vol. ii. pp. 217–220. (Leipzig, 1865.) The instrument receivedits name from Prince Cesi, who, on the advice of the learned Greek scholar Demiscianus, called it a "teleskopium."

and as it appeared to me that it depended upon the theory of perspective, I reflected on the manner of constructing it, in which I was at length so entirely successful that I made a spy-glass which far surpasses the report of the Flanders one. As the news had reached Venice that I had made such an instrument, six days ago I was summoned before their highnesses the signoria, and exhibited it to them, to the astonishment of the whole senate. Many noblemen and senators, although of a great age, mounted the steps of the highest church towers at Venice, in order to see sails and shipping that were so far off that it was two hours before they were seen steering full sail into the harbour without my spy-glass, for the effect of my instrument is such that it makes an object fifty *miglia* off appear as large and near as if it were only five."[1]

Galileo further relates in the same letter that he had presented one of his instruments to the senate, in return for which his professorship at Padua had been conferred on him for life, with an increase of salary to one thousand florins.[2]

On his return to Padua he became eagerly engrossed in telescopic observation of the heavens. The astonishing and sublime discoveries which were disclosed to him must in any case have possessed the deepest interest for the philosopher who was continually seeking to solve nature's problems, and were all the more so, since they contributed materially to confirm the Copernican theory.

His observations were first directed to the moon, and he discovered that its surface was mountainous, which showed at all events that the earth's satellite was something like the earth itself, and therefore by no means restored it to the aristocratic position in the universe from which it had been displaced by Copernicus. The milky way, as seen through the telescope, revealed an immense number of small stars. In Orion, instead of the seven heavenly bodies already known, five hundred new stars were seen ; the number of the Pleiades, which had been fixed at seven, rose to thirty-six ; the planets showed themselves as disks, while the fixed stars appeared as before, as mere bright specks in the firmament.

But the indefatigable observer's far most important dis-

[1] Op. vi. pp. 75–77.

[2] See the decree of the senate, 25th Aug., 1609. (Op. xv. pp. 392, 393.)

covery, in its bearing on the Copernican theory, was that of the moons of Jupiter, in January 1610. As they exhibited motions precisely similar to those which Copernicus had assumed for the whole solar system, they strongly fortified his theory. It was placed beyond all doubt that our planet was not the centre of all the heavenly bodies, since Jupiter's moons revolved round him. The latter was brought, so to speak, by the discovery of his attendants, into relations with the earth which, considering the prevailing views, were humiliating enough, and the more so since Jupiter had four satellites while the earth had only one. There remained, however, the consoling assurance that he and they revolved round our abode!

In honour of the reigning house of his native country, and as an acknowledgment of favours received from it (for since the accession of Cosmo II.[1] Galileo had been in high favour), he called Jupiter's moons "Medicean stars." The urgent solicitude of the French court to gain, by Galileo's aid, a permanent place on the chart of the heavens, is very amusing. Thus, on 20th April, 1610, he received a pressing request, "in case he discovered any other fine star, to call it after the great star of France, Henry IV., then reigning, the most brilliant in the whole universe, and to give it his proper name of Henry rather than that of the family name of Bourbon." Galileo communicated this flattering request, as he seems to have considered it, with much satisfaction to the secretary of the Tuscan court, Vincenzo Giugni, in a letter from Padua, on 25th June, 1610,[2] as an evidence of the great importance attached to his telescopic discoveries. He added that he did not expect to find any more planets, as he had already made many very close observations.

[1] Cosmo II. showed all his life a sincere attachment to his old teacher Galileo. From 1605, before Cosmo was reigning prince, Galileo had regularly given him mathematical lessons during the academical holidays at Florence, and had thereby gained great favour at the court of Tuscany.

[2] Op. vi. pp. 107–111.

Galileo published by degrees all the discoveries he had made at Padua, of which we have only noticed the most important, in the work before mentioned, the "Sidereus Nuncius"; it was dedicated to the Grand Duke, Cosmo II., and the first edition appeared at Venice, in March, 1610.

Although the unexpected discoveries which Galileo had made with his telescope had confirmed his opinion that the system of Copernicus was the only one consistent with the facts of nature, had indeed made it his absolute conviction, he had not yet ventured to defend it in his works. He contented himself with stating bare facts, without showing their relation to the ideas of Copernicus, leaving this to the learning and insight of the reader. Moreover, the logical inferences from Jupiter's moons must surely stare every thoughtful man in the face, and so indeed they did in a way very unwelcome to the scientific conservatives.

The storm raised by Galileo's latest announcements was tremendous. People heard with amazement the extraordinary things which the new invention had brought to light, and paid a just tribute of admiration to the man to whose labours it was due. But these discoveries were so directly opposed to the traditional natural philosophy, still regarded as the highest wisdom, that the "Sidereus Nuncius" had met with many opponents. It must however be borne in mind that at the time of its first publication very few of the learned were in a position to convince themselves with their own eyes of the correctness of the appearances seen with the telescope, simply because they had not the instrument at hand. From this cause, even Kepler did not see the satellites of Jupiter till 30th August, 1610. But men so free from jealousy and prejudice as Kepler (who, on reading the "Sidereus Nuncius," at once recognised the truth of the discoveries, and said with enthusiasm that "Galileo had in this book given evidence of the divinity of his genius."[1]), have at all times been rare.

[1] See the letter of Martin Hasdal from Prague, of 15th April, 1610, to

At first, therefore, the majority of the learned world shook their heads incredulously about the phenomena announced by the "Nuncius," especially in Italy, where envy lent its aid to bring an armed opposition into the field. Little did it at first avail that Kepler, renowned as the first astronomer in Germany, was on the side of the "Sidereus Nuncius"; for in May of the same year he had a reprint of the work issued at Prague, with an introduction in which he expressed his entire conviction of the truth of the telescopic discoveries made known by it, and answered all objections.[1] In vain. These new discoveries were too revolutionary to be believed. Even upright and estimable scientific men, like Welser in Augsburg, and Clavius at Rome, did not give credit to Galileo's statements until they learnt better by their own observations. The latter, who was the first mathematician in Rome in his day, even said "he laughed at the pretended satellites of Jupiter; you must construct a telescope which would first make them and then show them." Let Galileo hold his own opinions, and he (Clavius) would hold his.[2]

But the leader of an unworthy agitation in Italy against Galileo was a man who assumed this attitude from very different motives from the sacred service of science. This was the well-known Professor Magini, astronomer at the university of Bologna, who, next to Galileo, enjoyed the highest reputation for learning in Italy. He could not brook that his famous countryman should all at once obtain the highest fame with seven-league boots, leaving a pigmy like himself far behind, by means of the discoveries made known in his "Sidereus Nuncius." He must not only be refuted

Galileo (Op. viii. pp. 58–60); also a letter from Julian de' Medici, Tuscan ambassador at the Imperial court, to Galileo, from Prague, 19th April 1610. (Wolynski, "Lettere inedite," etc., p. 20.)

[1] This reprint bore the following superscription: "Joannis Kepleri Mathematici Cæsarei Dissertatio cum Nuncio Sidereo nuper ad mortales misso a Galilaeo Galilaeo Mathematico Patavino." Comp. Venturi, vol. i. pp. 99–120.

[2] Op. vi. p. 121, note 1.

the refutation must be circulated as widely as possible. But the most repulsive feature in Magini's conduct towards Galileo is his double-facedness. He never openly ventured with any work into the arena himself, but incited others all the more from behind concealment.[1] Even if we do not, with Martin Hasdal and Alexander Sertini, accuse him of being exactly the instigator of the famous libel "Peregrinatio contra Nuncium Sidereum," published by his assistant, Martin Horky, against Galileo in 1610, which excited the indignation of all the right-minded learned world, we cannot acquit him of complicity with him, and of having had a hand, more or less, in that pamphlet. The suspicion is strongly confirmed by the ostentation with which Magini, when told of the publication of the "Peregrinatio," drove the author, with disgust and ridicule, out of his house, and took occasion to assert on all hands that he had nothing whatever to do with the shameful act of his famulus, an assertion in strange contradiction with the excuse afterwards made by Horky to Kepler.[2] By Kepler's advice Galileo did not do him the honour of answering. The task was undertaken by Wedderburn, a Scotchman, formerly a pupil of Galileo's, and Antonio Roffeni, professor of philosophy at the university of Bologna; the former at Padua during the same year, the latter at Bologna in 1611.[3]

Meanwhile, in July, 1610, Galileo had observed a new appearance in the heavens by means of his telescope, the ring of Saturn. In consequence, however, of the imper-

[1] Compare the letters of Martin Hasdal, Alexander Sertini, and Kepler to Galileo in 1610. (Op. viii. pp. 60–63, 65–68, 82–85, 88, 89, 101, 113–117.)

[2] See the letter which Kepler wrote about it to Galileo on 25th Oct. 1610. (Op. viii. pp. 113–117.)

[3] Wedderburn's reply was called: "Quatuor Problematum, quæ Martinius Horky contra Nuncium Sidereum de quatuor Planetis novis proposuit"; Roffeni's, "Epistola apologetica contra cœcam peregrinationem cujusdam furiosi Martini cognomine Horky editam adversus, Nuncium Sidereum."

fection of the instrument, it did not appear like a ring, but Saturn looked like a triple star. Galileo, who on the one hand did not wish to make the new discovery public until he had sufficiently observed it, yet feared on the other that some one might claim priority, at once communicated it in a letter from Padua, 30th July, 1610,[1] to his influential friend Belisario Vinta, chief secretary of state to Cosmo II., but urgently begged him to keep it a secret. But even this did not seem sufficient to secure his right to the first observation of Saturn, so he announced it to his friends in the following absurd anagram :—

SMAJSMRMJLMEPOETALEVNJPVNENVGTTAVJRAS.

Kepler puzzled for a long time over this enigma, and at last only made out the barbaric line, "Salve umbistineum geminatum Martia proles," which he incorrectly applied to the planet Mars. At length, after repeated requests, and after Julian de' Medici, Tuscan ambassador at the Imperial court, had been charged by the Emperor to ask for a solution, he complied with the illustrious wish, and in a letter to Julian of 13th November, 1610,[2] gave the following startling explanation :—

Altissimum Planetam tergeminum observavi.

The learned and semi-learned world of Italy had not yet had time to become reconciled to the surprising discoveries announced in the "Sidereus Nuncius" of March in the same year, when the asserted triple nature of Saturn contravened the prevailing idea that there was nothing new to be discovered in the heavens. The recognition of Galileo's telescopic discoveries made way very slowly. From the first he spared no pains in popularising them. He did this repeatedly in public lectures, and with so much success that he could write to Vinta : "even the most exalted personages, who have been most vehement in attacking my doctrines, at

[1] Op. vi. pp. 114, 115.

[2] Op. vi. p. 127.

length gave up the game for lost, and acknowledged, *coram populo*, that they were not only convinced but ready to defend them against those philosophers and mathematicians who ventured to attack them." [1]

But it was only at the University of Padua that Galileo could report such rapid progress; and until the Maginis, Clavios, and others were convinced by their own eyes, and confirmed to their own party the truth of Galileo's disclosures, he had to sustain a hard struggle with incredulity, malice, and peripatetic fanaticism. Some rabid Aristotelians went so far as to say that Galileo's telescope was so constructed as to show things that did not exist! Nor did it mend the matter much when he offered 10,000 scudi to any one who should construct so cunning an instrument.[2] Others resolutely refused even to look through the telescope, giving it as their firm conviction that they would not be able to see appearances which Aristotle had not said a word about in all his books! The answer that Aristotle was not acquainted with the telescope, and uld not have known anything of telescopic appearances, bounded without effect from the petrified infallibility of ristotelian wisdom. Nor must it be supposed that these ort-sighted conservatives only numbered a few would-be *vans* of the Peripatetic school; on the contrary, celebrities e Cesare Cremonino da Cento, and Julius Libri, denied lileo's discoveries *a priori*.[3] When Libri died in December, 10, without having been willing to look through a lescope, and protesting against Galileo's "absurdities," lileo wrote in a letter of 17th December that this rigid ponent of his "absurdities," as he was never willing to look them from earth, might perhaps see them on his way to aven![4]

Some passages from a letter of Galileo's to Kepler, of 19th ugust, 1610, will best show how some of these men of cience turned away with a righteous awe from the incon-

[1] May 7th, 1610. (Op. vi. pp. 93–99.) [2] Op. vi. p. 165.
[3] Op. xv. (Viviani), p. 343. [4] Op. vi. p. 129.

venient recognition of the truth. Galileo writes among other things :—

"You are the first and almost the only person who, even after but a cursory investigation, has, such is your openness of mind and lofty genius, given entire credit to my statements. . . . We will not trouble ourselves about the abuse of the multitude, for against Jupiter even giants, to say nothing of pigmies, fight in vain. Let Jupiter stand in the heavens, and let the sycophants bark at him as they will. . . . In Pisa, Florence, Bologna, Venice, and Padua many have seen the planets; but all are silent on the subject and undecided, for the greater number recognise neither Jupiter nor Mars and scarcely the moon as planets. At Venice one man spoke against me, boasting that he knew for certain that my satellites of Jupiter, which he had several times observed, were not planets because they were always to be seen with Jupiter, and either all or some of them, now followed and now preceded him. What is to be done? Shall we side with Democritus or Heraclitus? I think, my Kepler, we will laugh at the extraordinary stupidity of the multitude. What do you say to the leading philosophers of the faculty here, to whom I have offered a thousand times of my own accord to show my studies, but who with the lazy obstinacy of a serpent who has eaten his fill have never consented to look at planets, nor moon, nor telescope? Verily, just as serpents close their ears, so do these men close their eyes to the light of truth. These are great matters; yet they do not occasion me a surprise. People of this sort think that philosophy is a kind of book like the Æneid or the Odyssey, and that the truth is to be sought, not in the universe, not in nature, but (I use their own words) *by comparing texts*. How you would laugh if you heard what things the first philosopher of the faculty at Pisa brought against me in the presence of the Grand Duke for he tried, now with logical arguments, now with magical adjurations, to tear down and argue the new planets out of heaven."[1]

[1] Op. vi. pp. 116–118. Ponsard in his drama, "Galileo," of which a third edition appeared at Paris in 1873, in which he mostly turns history upside down, in Act i. sc. iii. and iv. takes off capitally the proud and silly opposition of the Aristotelians.

CHAPTER III.

REMOVAL TO FLORENCE.

Galileo's Fame and Pupils.—Wishes to be freed from Academic Duties.—Projected Works.—Call to Court of Tuscany.—This change the source of his Misfortunes.—Letter from Sagredo.—Phases of Venus and Mercury.—The Solar Spots.—Visit to Rome.—Triumphant Reception. Letter from Cardinal del Monte to Cosmo II.—The Inquisition.—Introduction of Theology into the Scientific Controversy.—"Dianoja Astronomica."—Intrigues at Florence.

GALILEO'S fame, especially through his telescopic discoveries, and partly also through the exertions of his noisy opponents, had long extended beyond the narrow bounds of Italy, and the eyes of all central Europe were directed to the great astronomer. Numbers of pupils flocked to him from all countries, so that no lecture room in Padua was large enough to hold them. There were some distinguished personages among them, such as the Archduke Ferdinand of Austria, the Landgrave Philip of Hesse, the princes of Alsace, Mantua, etc., who mostly came to attend the lectures of the versatile master on fortification. It is, however, another fable of over zealous biographers to state that even Gustavus Adolphus, the hero of the thirty years' war, went to school for some months to Galileo.[1]

This close occupation, with lectures and private lessons of all kinds, took him too much away from his own studies, and after twenty years' professorship Galileo longed for a post in which he could prosecute his own researches, and devote himself to the completion of his works, free from academic

[1] Comp. Op. xv. p. 397, note 11, also Venturi, vol. i. pp. 19, 20. Jagemann (p. 52) even believes "that Gustavus Adolphus, who created an entirely new science of warfare which set all Europe in consternation and terror, had derived his wonderful knowledge from Galileo"!

duties. A letter from Padua, even in the spring of 1609,[1] shows his longing for this salaried leisure. But he is aware that the republic can never offer him such a post, "for it would not be suitable to receive a salary from a free state, however generous and magnanimous, without serving the public for it; because if you derive benefit from the public, you have the public to please, and not a mere private person." He also mentions that he can only hope for such a favour from some absolute sovereign; but it must not be supposed that he wishes for an income without doing anything for it; he was in possession of various inventions, was almost daily making new ones, and should make more if he had the necessary leisure. Galileo adds that it has always been his intention "to offer them to his own sovereign and natural lord before any other, that he may dispose of them and of inventor according to his pleasure; and if it seemed good to his serene highness to accept it, to present him not only with the jewel but with the casket also."

This first attempt of Galileo's, however, to gain a footing at the court of Tuscany seems to have been unsuccessful. At any rate in the extant correspondence of this period there is not a word more on the subject; and a few months later, after the construction of the telescope, he thankfully accepted the chair of mathematics at Padua offered to him for life by the republic. But this invention and the consequent discoveries had meanwhile acquired such vast importance, and had, as we have seen, raised such a storm in the whole educated world, that it now appeared very desirable to the court of Tuscany to attach to itself for ever the man on whom the eyes of scientific Europe were fixed.

The first steps towards this end were taken when Galileo went to Florence in the Easter recess of 1610 to show his telescopic discoveries to Cosmo II., especially the stars which

[1] Op. vi., 71–75. It is unfortunately unknown to whom this letter was addressed; but, as appears from the contents, it must have been to some one high in office at the court of Tuscany.

bore the name of the reigning house. We afterwards find Galileo entering eagerly into the negotiations which followed. In the letter to Vinta before mentioned, of May 7th, 1610, he presses for a decision, for, he says, observing that day after day goes by, he was determined to set a definite purpose before him in the ordering of the life that may be left to him, and to devote all his powers to perfect the fruits of his previous efforts and studies, from which he might look for some fame. He then mentions the conditions on which he at present serves the republic, perhaps in order that they might be guided by it at Florence; but what he lays most stress on is that it is of the utmost moment to him that leisure should be assured him for the completion of his labours, by his being freed from the obligation to give public lectures; but it will always confer on him the highest honour to give lectures to his sovereign, to whom also he will dedicate all his writings.

The same letter is also of the highest interest as giving us an insight into the scientific projects he was then cherishing. He communicates to the Tuscan secretary of state the works the completion of which lies so near his heart. He says:—

"The works which I have to finish are chiefly two books *de systemate, seu constitutione universi*, a vast project full of philosophy, astronomy, and geometry; three books *de motu locali*, an entirely new science, for no other inquirer, ancient or modern, has discovered any of the wonderful phenomena which I show to be present in natural and induced motion; I may therefore with perfect justice call it a *new* science discovered by me from its first principles; three books on mechanics, two relating to the demonstration of the principles and fundamental propositions, one containing the problems; although others have treated of the same subject, what has been hitherto written upon it is neither as to extent nor in other respects a fourth part of what I am writing. I have also various smaller works in view on matters connected with nature, such as *de sono et voce, de visu et coloribus, de maris æstu, de compositione continui, de animalium motibus*, and others. I am also thinking of writing some books for the soldier, not only to cultivate his mind, but to teach him by select instruction all those things connected with mathematics which it would be an advantage to him to

know, as, for instance, castrametation, military tactics, fortification, sieges, surveying, estimate of distances, artillery, the use of various instruments, etc." [1]

We regard with astonishment the wonderful versatility which we find displayed in Galileo's works. And amongst them are not only all the larger ones announced in the above letter; his important telescopic discoveries and his ceaselessly active mind led him far to surpass the bounds he had set himself, for he was the first to infuse conscious life into the slumbering idea of the Copernican system.

This memorable letter of Galileo's soon brought the court of Tuscany to a decision. Fourteen days later, 22nd May, Vinta wrote to him, as a preliminary, that the Grand Duke seemed well disposed to recall him to his native country and to grant all his wishes.[2] He promised to inform Galileo as soon as it was all settled. On 5th June he wrote that Cosmo II. was willing to nominate him as first philosopher and mathematician of the University of Pisa, with an annual stipend of 1000 Florentine scudi, without any obligation to live at Pisa or to give lectures. Vinta requested Galileo to let him know whether he agreed to these conditions, in order that he might have the necessary application drawn up in Galileo's name, as well as the decree and rescript; the time of their publication shall be left to Galileo, and meanwhile all shall be kept secret.[3] Galileo wished particularly that nothing should be known at Venice of these negotiations, which did not place his gratitude to the republic which had shown him so much favour in the best light, until all was decided and therefore irrevocable.

Having declared himself entirely satisfied with the proposed conditions, in a letter to the secretary of state, the

[1] It is not known that these last mentioned treatises ever appeared. As not the least trace of them is to be found, and yet numerous particulars have come down to us of other works afterwards lost, it may be concluded that these essays were never written.

[2] Op. viii. pp. 63, 64.

[3] Op. viii. pp. 73, 74

only alteration being that he should like not only to be first mathematican at Pisa, but also first mathematician and philosopher to the Grand Duke himself,[1] the decree summoning him to the court of Tuscany in this twofold capacity was issued on 12th July, 1610.

Notwithstanding all the great advantages which this new post secured to him, it was a very bad exchange for Galileo from the free republican soil to the doubtful protection of a princely house which, although very well disposed towards him, could never offer so decided an opposition to the Roman curia as the republic of Venice. It was indeed the first step which precipitated Galileo's fate.[2] In the Venetian republic full liberty of doctrine was really enjoyed, in religious Tuscany it was only nominal. In Venice politics and science were secure from Jesuitical intrigues; for when Pope Paul V. thought proper to place the contumacious republic under an interdict in April, 1606, the Jesuit fathers had been compelled to quit the soil of Venice "for ever."[3] In Tuscany, on the contrary, where they felt quite at home, their influence weighed heavily on everything affecting their own interests, and especially therefore on politics and science. Had Galileo never left the pure, wholesome air of the free city for the stifling Romish atmosphere of a court, he would have escaped the subsequent persecutions of Rome; for the republic which, not long before, had been undaunted by the papal excommunication of their doge and senate, would assuredly never have given up one of its university professors to the vengeance of the Inquisition.

At the beginning of September, 1610, Galileo, to the no small displeasure of the Paduans, left their university, at which eighteen years before he had found willing recep-

[1] Op. vi. p. 112.

[2] Libri justly says, p. 38: "this mistake was the beginning of all his misfortunes."

[3] In a letter from Galileo to his brother Michel Angelo, of May 11th, 1606, he describes the somewhat comical scene of the nocturnal deportation of the Jesuits from the city of Lagunes. (Op. vi. p. 32.)

tion and support when his longer tarriance at Pisa had become impossible; deserted his noble friends, Fra Paolo Sarpi, Francesco Sagredo, and others; and proceeded to the capital of the court of Tuscany on the lovely banks of the Arno, where at first, it is true, much honour was done him, but where afterwards envy, jealousy, narrowness, ill will, and fanaticism combined together to his destruction. One of his most devoted friends, Francesco Sagredo, foresaw it. When Galileo left Venice he was in the East, in the service of the republic, and did not return till the spring of 1611, when he wrote a remarkable letter to his friend at Florence. After having heartily expressed his regret at not finding Galileo on his return home, he states his doubts about the step his friend had taken. He asks, among other things, "where will he find the same liberty as in the Venetian territory? And notwithstanding all the generous qualities of the young ruler, which permitted the hope that Galileo's merits will be justly valued, who can promise with any confidence that, if not ruined, he may not be persecuted and disquieted on the surging billows of court life, by the raging storms of envy?" It is evident from another passage in the letter that Galileo's behaviour had made a bad impression at Venice, where they had not long before raised his salary to a thousand florins, and conferred his professorship on him for life; towards the end of the letter Sagredo lets fall the ominous words that he "was convinced *that as Galileo could not regain what he had lost,* he would take good care to hold fast what he had gained." [1]

Only a month after Galileo's arrival at Florence he made a fresh discovery in astronomy which eventually contributed to confirm the Copernican theory, namely, the varying crescent form of the planet Venus. With this the important objection to the new system seemed to be removed, that Venus and Mercury did not exhibit the same phases of light as the moon, which must be the case if the earth moved, for they would

[1] Op. viii. p. 146–150.

vary with her position in the universe. Galileo communicated this appearance, which entailed conclusions so important, and which he therefore wished to investigate more thoroughly before making it known, to his friend and correspondent Julian de' Medici at Prague, in an alphabetical enigma, as in the case of the singular appearance of Saturn. It was as follows:

"Hæc immatura a me jam frustra leguntur o y."[1]

Having fully convinced himself by nearly three months' observations that Venus and Mars exhibited phases similar to those of the moon, he made it known in two letters of 30th December[2] to Father Clavius, at Rome, and to his former distinguished pupil Benedetto Castelli, abbot of the congregation of Monte Cassino, in Brescia; and in a letter of 1st January, 1611, he sent the following solution of the anagram to Julian de' Medici:—

"Cynthiæ figuras æmulatur mater amorum."

In this letter he draws the important conclusions, first that none of the planets shine by their own light, and secondly "that necessarily Venus and Mercury revolve round the sun; a circumstance which was surmised of the other planets by Pythagoras, Copernicus, Kepler, and their followers, but which could not be proved by ocular demonstration, as it could now in the case of Venus and Mercury. Kepler and the other Copernicans may now be proud to have judged and philosophised correctly, and it may well excite disgust that they were regarded by the generality of men of book learning as having little understanding and as not much better than fools."[3]

At this time Galileo was also eagerly occupied with a phenomenon which was to be a further confirmation of the

[1] 11th Dec., 1610. (Op. vi. p. 128.)
[2] Op. vi. pp. 130–133 and 134–136.
[3] Op. vi. pp. 137, 138.

Copernican view of the universe, the spots on the sun. By attentively observing their motions on the sun's disk he afterwards discovered the sun's motion on its own axis, a fatal blow to the Ptolemaic system. Although to science it may be quite indifferent whether Galileo, or Fabricius, or the Jesuit father Scheiner first espied the spots on the sun (for they all lay claim to the discovery), for us it has its importance, because the bitter contention between Galileo and Scheiner on the subject materially contributed to set the stone rolling which, in its fall, was no less disastrous to the moral greatness of Galileo than to the erudition of Rome.

In consideration of the intense interest excited by Galileo's "epoch-making" discoveries, the Roman curia, which still held it to be one of its most important duties to guard mankind as much as possible from precocious knowledge, was of course eager to learn more about them, and above all, of the conclusions which the discoverer drew from them. It must also have appeared of great importance to Galileo to acquaint the Roman *savans* and dignitaries of the Church with his scientific achievements, for the authority and influence then exercised by them over the free progress of science made their opinions of the utmost moment to him. They must, if possible, be first made to see the premises with their own eyes, that they might afterwards be able to comprehend and assent to the conclusions. Galileo clearly saw this, as appears from a letter of 15th January, 1611, to Vinta[1] (who was then with the court at Pisa), in which he urgently begs permission for a visit to the papal residence. The request was not only immediately granted, but the court placed a litter at his disposal, undertook to defray all his expenses, and directed the Tuscan ambassador at Rome to prepare quarters for him at the embassy and to entertain him during the whole of his stay.[2] Meanwhile, however, Galileo was at-

[1] Op. vi. p. 139, 140.

[2] Op. vi. p. 140, note 1. See also Vinta's answer to Galileo, 20th Jan. 1611 (Wolynski, "Lettere inedite," p. 27); also the Grand Duke's letter

tacked by an illness which delayed his journey for nearly two months. On 22nd March he received a cordial letter of introduction[1] from Michel Angelo the younger to Cardinal Barberini, afterwards Urban VIII., and on the next day he set out provided with his most convincing arguments, namely several excellent telescopes.

He was received with the greatest honour. His triumphs were really extraordinary, so great that they were sure to secure for him numerous personal enemies in addition to the opponents of his doctrines. He exhibited the oft discussed appearances to cardinals and learned men through the telescope, and, whenever he could, dispelled their doubts by the incontrovertible evidence of their own eyes. People could not refuse to believe this, and Galileo's success in the papal city was complete. Of still greater importance, however, was the opinion given on 24th April by four scientific authorities of the Roman College, on the character "of the new astronomical discoveries of an excellent astronomer," at the request of Cardinal Robert Bellarmine. This commission, consisting of the learned fathers Clavius, Griemberger, Malcotio, and Lembo, confirmed what they had long denied and ridiculed, convinced by the evidence of their own senses of the truth of the facts maintained by Galileo.[2] By this opinion of the papal experts his discoveries received, to a certain extent, the sanction of the Church, and became acknowledged truths. The care with which the mention of Galileo's name is avoided both in the request and the opinion is remarkable.

Attentions of all sorts were heaped upon the astronomer. Pope Paul V. granted him a long audience and graciously assured him of his unalterable good will, which however did not remain quite unaltered in the sequel. The highest dignitaries

to his ambassador at Rome, Giovanni Niccolini, of 27th Feb., 1611 (Wolynski, "La Diplomazia Toscana e Gal. Galilei," p. 10).

[1] Pieralisi has first published this letter in his work "Urban VIII. and Galileo Galilei," p. 41.

[2] See, for Bellarmine's request and the opinion, Op. viii. pp. 160–162.

of the Church testified their admiration; the Accadémia dei Lincei (of the Lynxes), founded six years before by Prince Cesi, made the renowned guest a member; when he took his departure at the beginning of June he left behind him in the metropolis of catholicism as many sincere friends and admirers as envious foes, the fate of all really great men.

A letter from Cardinal del Monte of 31st May, 1611, to Cosmo II., best shows how successful Galileo's visit to Rome was. He writes with real enthusiasm :—

"Galileo has during his stay at Rome given great satisfaction, and I think he must have felt it no less himself, for he had the opportunity of showing his discoveries so well that to all clever and learned men in this city they seemed no less true and well founded than astonishing. Were we still living under the ancient republic of Rome, I verily believe there would have been a column on the Capitol erected in his honour. It appeared to me to be my duty to accompany his return with this letter, and to bear witness to your Highness of the above, as I feel assured that it will be agreeable to you, since your Highness entertains such gracious good will towards your subjects, and to distinguished men like Galileo."[1]

But the watchful Inquisition had already directed its attention to the man who had made such portentous discoveries in the heavens. How far this had gone we unfortunately do not exactly know. The only well authenticated indication we possess is the following notice in the protocols of the sittings of the Holy Congregation: "Feria iii. die, 17 Maii, 1611. Videatur an in Processu Doctoris Cæsaris Cremonini sit nominatus Galilaeus Philosophiæ ac Mathematicæ Professor."[2] This is the first time that the name of Galileo occurs in the papers of the Congregation of the Holy Office, and it was in the midst of the applause which greeted him in the eternal city. Whether, and in what way, this official query was answered is not to be found in the documents of the Inquisition. But it looks ominous that there should be an inquiry about a connection between

[1] Op. viii. p. 145.

[2] Gherardi's Collection of Documents: Doc. i.

Galileo and Cremonini who was undergoing a trial. The causes and course of the trial of Cremonini by the Inquisition are not yet known. All that is known is that he was Professor of the philosophy of Aristotle at the University of Padua; and it appears from the letters of Sagredo to Galileo, that his lectures and writings had given rise to suspicions of atheism. For the rest, Cremonini was all his life one of Galileo's most decided enemies.

The very triumphs of Galileo and his telescopic discoveries were the causes, to a great extent, of those ceaseless and relentless persecutions which were to restrict his labours and embitter his life. The Aristotelians perceived with rage and terror that the revolutionary discoveries of this dangerous innovator were surely, if slowly, gaining ground. Every one of them, with its inevitable logical consequences, pulled down some important stone in the artistic structure of their views of nature; and unless some measures were taken to arrest the demolition, it was clear that the venerable edifice must fall and bury the inmates beneath the ruins. This must be averted at any price, even at the price of knowledge of the acts of nature. If Galileo's reformed physics offered no point of attack, his astronomy did; not indeed in the honourable contest of scientific discussion, but by bringing theology into the field against science.

Galileo had never openly proclaimed his adoption of the earth's double motion, but the demonstration of his telescopic observations alone sufficed to make it one of the burning questions of the day. What were the phases of Venus and Mercury, the motions of the solar spots, and above all Jupiter and his moons, this little world within our large one, as Galileo afterwards called it himself,[1] but telling proofs of the truth of the Copernican theory? The question of the two systems had been hitherto an exclusively scientific one. How else could the famous philosopher and astronomer Nicholas of Casa, who taught the double motion of the earth

[1] Op. vi. p. 274.

in the fifteenth century, have gained a cardinal's hat? How could the German, Widmanstadt, have explained his theory, which was based upon the same principles, to Pope Clement VII. in 1533? How could learned men like Celio Calganini, Wurteis, and others, have given public lectures on the subject in Italy in the second half of the sixteenth century? Neither Casa, however, nor Widmanstadt, Calganini, Wurteis, nor even Copernicus, had ventured openly to declare war with the school of Aristotle, nor to overthrow by the crushing evidence of experiment the dogmas of natural science, based upon philosophy and *à priori* arguments alone. These learned men had been tolerated because they fought with the same weapons as the followers of Ptolemy, logic and philosophy. They did not possess the powerful lever of direct evidence, because they were not acquainted with the telescope. But Galileo, with his fatal system of demonstration by observation of nature, was far too dangerous a foe. Peripateticism was no match for the home thrusts of arguments obvious to the senses, and its defenders were well aware that if they would not yield their position they must call in some other ally than mere science. And they adopted the means best adapted for putting a temporary drag on the wheels of truth, and for ruining Galileo; in order to prop up the failing authority of Aristotle they called in the inviolable authority of Holy Scripture!

This dragging of the Bible into what had previously been a purely scientific controversy, a proceeding which proved so fatal to Galileo, must not however, as has been done by several authors, be attributed solely to party considerations or even personal motives. This is absolutely false. Greatly as these factors were concerned in it, it must be admitted that at first they were only incidentally mixed up with it. The multitude of the learned, who still adhered entirely to the old system of the universe, and regarded the theories of Copernicus (not yet based on ocular demonstration) as mere fantasies, were really aghast at the telescopic discoveries

of Galileo which threatened to overturn all their previous beliefs. The learned, and still more the semi-learned, world of Italy felt the ground tremble beneath their feet; and it seemed to them as if the foundations of all physics, mathematics, philosophy, and religion, were, with the authority of Aristotle, which had reigned for two thousand years, being borne to the grave. This did not present itself to them as progress, but as sacrilege.

A young fanatic, the monk Sizy (the same who seven years later was broken on the wheel for political crimes at Paris), was the first to transfer what had been a purely scientific discussion to the slippery arena of theology. At the beginning of 1611 he published at Venice a work called "Dianoja Astronomica"[1] in answer to the "Sidereus Nuncius," in which he asserted that the existence of the moons of Jupiter was incompatible with the doctrines of Holy Scripture. He appropriately dedicated his book to that semi-prince of the blood, John de' Medici, who was known to be the mortal enemy of Galileo. The author, as we learn from his own work, was one of those contemptible men who carefully abstained from even looking through a telescope, although firmly convinced that the wonders announced by Galileo were not to be seen. Galileo did not vouchsafe to defend himself from this monkish attack any more than from Horky's libel the year before. He contented himself with writing on the back of the title page of the copy still preserved in the National Library at Florence the following lines from Ariosto:—

> "Soggiunse il duca: Non sarebbe onesto
> Che io volessi la battaglia torre,
> Di quel che m' offerisco manifesto,
> Quando ti piaccia, innanci agli occhi torre."[2]

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[1] The full title was: "Dianoja Astronomica, Optica, Physica, qua Siderei Nuncii rumor de quatuor Planetis a Galilaeo Galilaeo Mathematico celeberrimo, recens perspicilli cujusdam ope conspectis, vanus redditur. Auctore Francisco Sitio Florentino."

[2] Op. vi. p. 94, note 1; and xv. "Bibliografia Galileiana," p. vi.

But Galileo's envious foes at once consorted with the, at all events, honourable fanatics of the old school, and eagerly seized the opportunity of pursuing their miserable designs "to the glory of God and imperilled religion." It was in Florence itself, in the palace of the Tuscan Archbishop Marzimedici, who had once studied under Galileo at Pisa, that secret consultations were held, presided over by this prelate, how the inconvenient philosopher and his revolutionary system might best be ruined. They even then went so far as to request a preacher to hurl at Galileo from the pulpit the accusation, more dangerous than any other in the sixteenth century, that he was attacking the Bible with his doctrines. But for this time these pious gentlemen had gone to the wrong man, for the priest, seeing through the foul purpose of the commission, declined it.

Galileo had not the slightest knowledge of the secret conspiracy which was plotting against him, and was first roused from the security into which he had been lulled by the brilliant success of his visit to Rome by a letter from his friend there, Cigoli the painter, of 16th December, 1611.[1] But he did not at first attach to these communications the importance they deserved, and it was not until several months afterwards that he addressed himself to Cardinal Conti, who was very friendly to him, to ask how far the Holy Scriptures did really favour the Aristotelian views of the universe, and whether the Copernican system contradicted them.

Conti answered him in a letter of 7th July, 1612,[2] that the statements of Holy Scripture were rather against the Aristotelian principle of the unchangeableness of the heavens than in favour of it, for all the fathers had held the contrary opinion. But the case was different with the doctrine of the earth's revolution round the sun, as held by the Pythagoreans, Copernicus and others. This certainly did not seem to agree with Holy Scripture, unless it was assumed that it merely

[1] This letter reports the facts above mentioned. (Op. viii. p. 188.)

[2] Op. viii. pp. 222–224.

adopted the customary mode of expression. But, added the cardinal, that was a method of interpretation to be employed only in case of the greatest necessity. Diego di Zuñiga had indeed explained in this way, conformably with the Copernican opinions, the passage in which Joshua commanded the sun to stand still; but the explanation was not generally admitted.

Father Lorini also, professor of ecclesiastical history at Florence, afterwards a ringleader of the base intrigues against Galileo and an informant against him, wrote to him 5th November, 1612,[1] to deny a report that he had publicly preached against Galileo. He only confessed to having given it as his opinion, in a conversation about the two systems, that the view of this *Ipernic*, or whatever his name might be, appeared to be contrary to Holy Scripture. Galileo wrote in a letter of 5th January, 1613,[2] to Prince Cesi: "The good man is so well acquainted with the author of these doctrines that he calls him *Ipernic*. You can see how and by whom poor philosophy suffers." It appears also from the same letter that Galileo was now well aware of the intrigues being carried on against him in Florence, for he says among other things: "I thank you and all my dear friends very much for your anxiety for my protection against the malice which is constantly seeking to pick quarrels even here, and the more so since the enemy is so near at hand; but as they are but few in number, and their 'league,' as they call it among themselves, is but of limited extent, I laugh at it."

[1] Op. viii. pp. 241, 242.
[2] Op. vi. pp. 194–197.

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CHAPTER IV.

ASTRONOMY AND THEOLOGY.

Treatise on Floating Bodies.—Controversy with Scheiner about the Solar Spots.—Favourable reception of Galileo's work on the subject at Rome. —Discussion with the Grand Duchess Christine.—The Bible brought into the controversy.—Ill-fated Letter to Castelli.—Caccini's Sermon against Galileo.—Lorini denounces the Letter to the Holy Office.—Archbishop Bonciani's attempts to get the original Letter.—"Opinion" of the Inquisition on it.—Caccini summoned to give evidence.—Absurd accusations.—Testimony of Ximenes and Attavanti in Galileo's favour.

WHILE the storm which was to burst over Galileo's head was thus slowly gathering, he was making important progress in the departments of physics and mechanics.

His treatise on the motion of floating bodies led to very important results.[1] In it he again took the field against the Peripatetic philosophers, and refuted the assertion of Aristotle that the floating or partial immersion of bodies in water depended chiefly on their form, for by his approved method of studying the open book of nature he clearly showed the error of that opinion. In this work Galileo laid the foundations of hydrostatics as mostly held to this day. The old school rose up once more to refute him, as a matter of course; but their polemics cut a pitiful figure, for the champions of antiquated wisdom had in their impotence mostly to content themselves with wretched sophisms as opposed to Galileo's hard facts, and as a last resort to insist on the authority of Aristotle.

The combatants who took the field with various writings to

[1] "Discorso al Serenissimo D. Cosimo II., Gran-Duca di Toscana intorno alle cose che stanno in su l'aqua o che in quella si muovano."

defend the Peripatetic school against these fresh attacks of Galileo were the professors Giorgio Corressio, Tommaso Palmerini, Lodovico delle Colombo, in 1612, and in 1613 Vincenzo di Grazia. Corressio was answered by Benedetto Castelli; but the work, which is preserved in MS. in the National Library at Florence, was not published, out of pity for his opponent who, in the meantime, had been overtaken by severe misfortune. Although professing to be a Roman Catholic, he was discovered to belong to the Greek Non-Uniat church, which entailed the loss of his professorship at the University of Pisa. Galileo intended himself to answer Palmerini, but while he was doing so Palmerini died, and not wishing to fight a dead man, he laid his reply aside. The lame objections of the other two received a brilliant refutation in a work published in 1615 by Castelli. From the original MS., however, in the National Library at Florence, which is mostly in Galileo's handwriting, it is evident that he was the real author.[1]

During the same year in which he had so alarmed the Peripatetics by the treatise on floating bodies, he was much occupied with the controversy with the Jesuit father, Scheiner, before mentioned, professor of mathematics at Ingolstadt, about the solar spots and the priority of their discovery. In three letters to Welser of Augsburg (published there in 1612) he had claimed for himself, under the pseudonym of "Apelles," the earliest observation of these appearances, and explained them conformably to the traditional opinions. He propounded the ingenious idea that these spots were a multitude of little planets, passing over the sun's disk as they revolved round the earth. By this clever explanation he secured the applause of all the Peripatetic school, and proclaimed himself the decided foe of Galileo. Challenged to do so by Welser, Galileo replied in three letters addressed to him, in which "Apelles" came off but poorly.[2] Galileo con-

[1] Op. viii. p. 231, note 2; Nelli, p. 318; Venturi, vol. i. pp. 195, 196.

[2] Dated 4th May, 14th August, and 1st December, 1612.

vincingly refuted his opponent's explanation of the spots, and brilliantly defended his own right to the priority of their discovery by appealing to witnesses to whom he had made it known in 1610. These letters, together with Scheiner's, were published in March, 1613, under the title "History and Explanation of the Solar Spots,"[1] with a fine portrait of Galileo, and a dedication to his illustrious friend Salviati, of the "Accadémia dei Lincei."

The publication of this work was of especial significance, because it was the first in which Galileo decidedly takes the side of the Copernican system. This accounts for the extraordinary sensation made by these essays. The controversy on the two systems came more and more to the front. And yet, notwithstanding all this, no theological scruples seem at first to have been felt at Rome, even in the highest ecclesiastical circles. On the contrary, we find the cardinals Maffeo Barberini[2] (afterwards Pope Urban VIII.), and Federigo Borromeo,[3] thanking Galileo in the most friendly terms for sending them his work, and expressing their sincere admiration for the researches described in it. And Battista Agucchia, then one of the first officials at the court of Rome, and afterwards secretary of Pope Gregory XV., in a similar letter of thanks,[4] not only fully endorsed these opinions, but expressed his firm belief that they would in time be universally acknowledged, although now they had many opponents, partly from their novelty and remarkable character, and partly from the envy and obstinacy of those who had from the first maintained the contrary view.

The scientific circles of the university town of Pisa were far less friendly to the Copernican ideas than the higher ecclesiastics at the papal residence. Father Castelli, who in

[1] "Istoria e Dimostrazioni intorno alle Macchie Solari, e loro accidenti comprese in tre lettere scritte al Sig. Marco Velsero da Galileo Galilei."

[2] Letter of 20th April, 1613. (Op. viii. p. 262.)

[3] Letter of 26th May, 1613. (Op. viii. p. 271.)

[4] Letter of 8th June, 1613. (Op. viii. pp. 274, 275.)

October of the same year was called to the chair of mathematics at this university, reports in a letter of 6th November,[1] in which he tells Galileo what reception he had met with from the heads of the college, that the proveditor of the university, Mgr. d'Elci, had expressly forbidden him at his first interview to treat in his lectures of the double motion of the earth, or even to take occasion in any digression to mention it as probable!

An accidental circumstance, however, was the immediate cause of turning the controversy into the channel which proved so fatal to Galileo. One day in December, 1613, Castelli and several other learned men were guests at the Grand Duke's table at Pisa, where the court was then staying. The conversation turned chiefly on the remarkable phenomena of the Medicean stars, whose veritable existence in the heavens Boscaglia, professor of physics at the university, was constrained with a heavy heart to confirm, in answer to a question of the Grand Duke's mother, Christine. Castelli eagerly seized the opportunity of applauding Galileo's splendid discovery. Boscaglia, a Peripatetic of the purest water, could not master his displeasure, and whispered meanwhile to the Grand Ducal mother that all Galileo's telescopic discoveries were in accord with the truth, only the double motion of the earth seemed incredible, nay impossible, as the Holy Scriptures were clearly opposed to it. The repast was then over, and Castelli took leave; but he had scarcely left the palace when he saw Christine's porter hastening after him and calling him back. He obeyed, and found the whole company still assembled in the Grand Duke's apartments. Christine now began, after a few introductory remarks, to attack the Copernican doctrines, appealing to Holy Scripture. Castelli at first made some humble attempts to avoid bringing the Bible into the controversy; but as this was of no avail he resolutely took the theological standpoint, and defended the modern views of the universe so impressively and convinc-

[1] Op. viii. pp. 290, 291.

ingly that nearly all present, even the Grand Duke and his consort, took his side, and the Duchess dowager alone made any opposition. Boscaglia, however, who had been the cause of the unedifying scene, took no part whatever in the discussion.

Castelli hastened to apprise Galileo of this incident, but remarked expressly in his striking letter that it appeared to him that the Grand Duchess Christine had merely persisted in opposition, in order to hear his replies.[1]

This then was the provocation to that famous letter of Galileo's to his friend and pupil Castelli, in which for the first time theological digressions occur, and which therefore, although by no means intended for publication, was to be eagerly turned to account by his opponents, and to form the groundwork of the subsequent trial. From what has been related it will be seen that the reproach often brought against Galileo that it was he who first introduced the theological question into the scientific controversy about the two systems is entirely unwarranted. On the contrary, these explanations to Castelli, of 21st December, bear telling testimony to the indignation which Galileo felt in seeing the Scriptures involved in a purely scientific discussion, and that the right of deciding the question should even be accorded to them. He sharply defines the relation in which the Bible stands to natural science, marking the limits which it can only pass at the expense of the healthy understanding of mankind. As a good Catholic he fully admits that the Scriptures cannot lie or err, but thinks that this does not hold good of all their expositors. They will involve themselves in sad contradictions, nay, even in heresies and blasphemy, if they always interpret the Bible in an absolutely literal sense. Thus, for instance, they must attribute to God hands, feet, and ears, human feelings such as anger, repentance, hatred, and make Him capable of forgetfulness and ignorance of the future.

"As therefore," continues Galileo, "the Holy Scriptures in

[1] Op. viii. pp. 291–293.

many places not only admit but actually require a different explanation from what seems to be the literal one, it seems to me that they ought to be reserved for the last place in mathematical discussions. For they, like nature, owe their origin to the Divine Word; the former as inspired by the Holy Spirit, the latter as the fulfilment of the Divine commands; it was necessary, however, in Holy Scripture, in order to accommodate itself to the understanding of the majority, to say many things which apparently differ from the precise meaning. Nature, on the contrary, is inexorable and unchangeable, and cares not whether her hidden causes and modes of working are intelligible to the human understanding or not, and never deviates on that account from her prescribed laws. It appears to me therefore that no effect of nature, which experience places before our eyes, or is the necessary conclusion derived from evidence, should be rendered doubtful by passages of Scripture which contain thousands of words admitting of various interpretations, for every sentence of Scripture is not bound by such rigid laws as is every effect of nature."

Galileo goes on to ask: if the Bible, in order to make itself intelligible to uneducated persons, has not refrained from placing even its main doctrines in a distorted light, by attributing qualities to God which are unlike His character and even opposed to it, who will maintain that in speaking incidentally of the earth or the sun it professes to clothe its real meaning in words literally true? Proceeding on the principle that the Bible and nature are both irrefragable truths, Galileo goes on to draw the following conclusions.

"Since two truths can obviously never contradict each other, it is the part of wise interpreters of Holy Scripture to take the pains to find out the real meaning of its statements, in accordance with the conclusions regarding nature which are quite certain, either from the clear evidence of sense or from necessary demonstration. As therefore the Bible, although dictated by the Holy Spirit, admits, from the reasons given above, in many passages of an interpretation other than the

literal one; and as, moreover, we cannot maintain with certainty that *all* interpreters are inspired by God, I think it would be the part of wisdom not to allow any one to apply passages of Scripture in such a way as to force them to support, as true, conclusions concerning nature the contrary of which may afterwards be revealed by the evidence of our senses or by necessary demonstration. Who will set bounds to man's understanding? Who can assure us that everything that can be known in the world is known already? It would therefore perhaps be best not to add, without necessity, to the articles of faith which refer to salvation and the defence of holy religion, and which are so strong that they are in no danger of having at any time cogent reasons brought against them, especially when the desire to add to them proceeds from persons who, although quite enlightened when they speak under Divine guidance, are obviously destitute of those faculties which are needed, I will not say for the refutation, but even for the understanding of the demonstrations by which the higher sciences enforce their conclusions.

I am inclined to think that the authority of Holy Scripture is intended to convince men of those truths which are necessary for their salvation, and which being far above man's understanding cannot be made credible by any learning, or any other means than revelation by the Holy Spirit. But that the same God who has endowed us with senses, reason, and understanding, does not permit us to use them, and desires to acquaint us in any other way with such knowledge as we are in a position to acquire for ourselves by means of those faculties, *that* it seems to me I am not bound to believe, especially concerning those sciences about which the Holy Scriptures contain only small fragments and varying conclusions; and this is precisely the case with astronomy, of which there is so little that the planets are not even all enumerated."

Having emphatically declared that thus dragging the Bible into a scientific controversy was only a subterfuge of his

opponents, who, feeling that they could not successfully fight him on his own ground, had entrenched themselves behind an unassailable bulwark, Galileo proceeds to discuss the well known passage in Joshua which the Aristotelians were fond of adducing to demonstrate the contradictions between the modern views and Holy Scripture. His object is to beat his adversaries with their own weapons, by showing that if this passage is taken literally, and God really arrested the sun in his course in answer to Joshua's prayer, and thus prolonged the day, it makes the incorrectness, nay the impossibility, of the Ptolemaic system quite clear, while the Copernican agrees with it very well. According to the Ptolemaic ideas, Galileo goes on, the sun has two motions, the annual one from west to east, and the daily one from east to west. Being diametrically opposed to each other, they cannot both be the sun's own motions. The annual motion is the one which belongs to it; the other originates in the *primum mobile*, which carries the sun round the earth in twenty-four hours and occasions day and night. If therefore God desired to prolong the day (supposing the Ptolemaic system to be the right one) He must have commanded, not the sun but the *primum mobile*, to stand still. Now, as it is stated in the Bible that God arrested the sun in its course, either the motions of the heavenly bodies must be different from what Ptolemy maintained them to be, or the literal meaning must be departed from, and we must conclude that the Holy Scriptures, in stating that God commanded the sun to stand still, meant the *primum mobile*, but, accommodating themselves to the comprehension of those who are scarcely able to understand the rising and setting of the sun, said just the opposite of what they would have said to scientifically educated people. Galileo also says that it was highly improbable that God should have commanded the sun alone to stand still, and have allowed the other stars to pursue their course, as all nature would have been deranged by it without any occasion, and his belief was that God had enjoined a temporary rest on the

whole system of the universe, at the expiration of which all the heavenly bodies, undisturbed in their mutual relations, could have begun to revolve again in perfect order: doubtless his inmost conviction, although to us it sounds like irony.

At the close of this long letter he explains how the literal sense of the passage accords with the Copernican system. By his discovery of the solar spots the revolution of the sun on its axis is demonstrated; moreover it is also very probable that the sun is the chief instrument of nature, the heart of the universe so to speak, and not only, as is known with certainty, is the source of light to the planets revolving round it, but also lends them their motion. If, further, we accept with Copernicus a revolution of the earth, at any rate a diurnal motion on its own axis, it would certainly suffice merely to stop the sun in his course, in order to bring the whole system to a standstill, and thus to prolong the day without disordering nature.[1]

Castelli saw nothing ominous in this exhaustive reply to the Grand Duchess Christine's objections, and took care to give it a wide circulation by means of numerous copies. Galileo's enemies, however, eagerly grasped the dangerous weapon thus guilelessly placed in their hands by his friend. They ingeniously gave a meaning to the epistle which exactly adapted it to their purpose. They turned Galileo's emphatic opinion that the Scriptures had no business in a scientific controversy into the reproach that he assailed the universal authority of the Bible; by making Joshua's miracle the subject of his disquisitions he laid himself open to the cutting remark that the statements of Holy Scripture must be protected from the arbitrary interpretations of profane laymen.

Gherardini, the worthy bishop of Fiesole, who was apparently entirely unaware of the existence of Copernicus, was so enraged about the system that Galileo had defended that he publicly insulted him, and threatened to bring the matter

[1] Op. ii. pp. 6–13.

before the Grand Duke. He could only be pacified by being informed that the founder of that system was not any man then living in Tuscany, but a German who had died seventy years before, and that his work had been dedicated to Pope Paul III., and had been graciously accepted by him.

Meanwhile, the league formed in Florence against Galileo had found in Father Caccini, a Dominican monk, the right tool for setting on foot the long-desired scandal. He had had some experience in misuse of the pulpit, for he had before this got up a scene in church at Bologna. And as the favourable moment for action had now arrived, Caccini appeared as Galileo's first public accuser by thundering out a fierce sermon against the astronomer and his system on the fourth Sunday after Advent, 1614, in the church of Santa Maria Novella, at Florence. He showed his wit by selecting as the two texts for his philippic the tenth chapter of Joshua and the first chapter of Acts. He began with the words: *Viri Galilæi quid statis aspicientes in cœlum*: "Ye men of Galilee, why stand ye gazing up into heaven?" Astronomy was thus happily introduced into the pulpit. The furious preacher asserted that the doctrine taught by Galileo in Florence, of the earth's revolution round the sun, was quite irreconcilable with the Catholic religion, since it glaringly contradicted several statements in Holy Scripture, the literal meaning of which, as adopted by the fathers, was opposed to it. And, as he further asserted that no one was permitted to interpret the Bible in any other sense than that adopted by the fathers, he as good as denounced the doctrine as heretical. The sermon ended with a coarse attack on mathematicians in general, whose science he called an invention of the devil; and with a wish that they should be banished from all Christian states, since all heresies proceeded from them.

As was to be expected, the affair caused a great sensation. Father Luigi Maraffi, a Dominican monk distinguished for his learning, who was all his life an admirer of Galileo, told

him in a letter of 10th January, 1615,[1] how heartily he regretted this miserable exhibition. He said, among other things: "I have been extremely annoyed at the scandal which has taken place, and the more so because the author of it is a brother of my order; for, unfortunately, I have to answer for all the stupidities (*tutte le bestialità*) which thirty or forty thousand brothers may and do actually commit." This sentence has caused all Galileo's biographers who mention this letter, with the exception of Nelli,[2] to conclude that Maraffi was the general of the order of Dominicans; yet a glance at the *Scriptores Ordinis Prædicatorum*, etc., edited by the Fathers Quetif and Echard, would have shown them that from 1612 to 1629 Father Seraphin Secco, of Pavia, was general, and was succeeded by Nicholas Ridolfi.[3] Perhaps, however, Father Maraffi bore the title of a preacher of the Dominican order, which fully explains his letter to Galileo.[4]

Galileo thought of complaining to the ecclesiastical authorities of the insult which had been offered him, and of demanding satisfaction. But Prince Cesi, whom he consulted about it, strongly advised him, if any steps were taken against Caccini, to keep himself entirely out of the affair and to avoid all mention of the Copernican theory; for Cardinal Bellarmine, the first authority of the sacred college, had told him (Cesi) that *he held the opinion to be heretical, and that the principle of the earth's double motion was undoubtedly contrary to Holy Scripture.* In this complicated state of affairs the prince recommended that several mathematicians should complain of the public insults to the science of mathematics and its disciples. But he gave another express warning to leave the Copernican system entirely alone, or they might take occasion at Rome to consult whether the further spread of this opinion was to be permitted or con-

[1] Op. viii. pp. 337, 338.
[2] Vol. i. p. 397.
[3] Comp. Govi, p. 47.
[4] Epinois, "La Question de Galilei," p. 43.

demned. Cesi added that in that case it would very likely be condemned, as the Peripatetic school was in the majority there, and its opponents were generally hated; besides, it was very easy to prohibit and suspend.[1]

Although Galileo took this hint, and the affair of Caccini was prudently allowed to drop, it must be regarded as the first impetus to all the later persecutions of Galileo.

The questionable merit of having brought Galileo's affairs before the tribunal of the Inquisition belongs to Father Lorini, a friend of Caccini, and brother of the same order. Galileo's fatal letter to Castelli had fallen into his hands; and when, later on, thanks to Caccini's zeal, a great ferment began about it in monkish circles at Florence, Lorini was moved to send a denunciation of the letter and a copy of it secretly to the Holy Office at Rome. The whole statement, which was addressed to Cardinal Mellini, President of the Congregation of the Index, is couched in a most artful and miserable style. The denunciator, too cowardly and too cunning to mention Galileo by name (for he still had powerful friends even among the highest dignitaries of the Church), only speaks of the "Galileists" in general, "who maintain, agreeably to the doctrine of Copernicus, that the earth moves and the heavens stand still." He even ascribes the enclosed letter to Copernicus, in order to leave the honoured philosopher quite out of the question. Lorini goes on to say: "all the fathers of this (his own) devout convent of St. Mark find many passages in this letter which are suspicious, or presumptuous, as when it says that many expressions of Holy Scripture are indefinite; that in discussions about natural phenomena the lowest place must be assigned to them; that the commentators have often been mistaken in their interpretations; that the Holy Scriptures should not be mixed up with anything but matters of religion; that in nature philosophical and astronomical evidence is of more value than holy and Divine (which pas-

[1] Op. viii. pp. 337–343.

sages your reverence[1] will find underlined by me in the said letter, of which I send an exact copy); and, finally, that when Joshua commanded the sun to stand still, we must only understand that the command was addressed to the *primum mobile*, as this itself is the sun." In these statements Lorini perceives great peril for the Church; he is indignant "that they (the Galileists) should explain the Holy Scriptures after their own fashion, and differently from the usual interpretation of the fathers, and should defend an opinion which the Holy Scriptures appear to be entirely opposed to. . . . They tread the entire philosophy of Aristotle, of which scholastic philosophy has made so much use, under foot," he exclaims: "in short, to show how clever they are, they (the Galileists) say a thousand shameless things and scatter them abroad in our city, which holds fast to the Catholic faith, both from its own good spirit and the watchfulness of our august rulers." He feels moved to inform the cardinal of all this, that he may keep an eye on it, and that if any remedy seems called for he may take the necessary measures. After this ominous hint he hypocritically adds: "I, who hold that all those who call themselves Galileists are orderly men and good Christians, but a little over wise and self conceited in their opinions, declare that I am actuated by nothing in this business but zeal for the sacred cause." After this assurance he begs that this letter of his, ("I do not say the enclosed letter,") he hastens to add in a parenthesis, "may be kept secret and considered merely a friendly exchange of opinion between servant and master," and not as a legal deposition.[2] In conclusion, he expressly mentions the celebrated sermon of Caccini, probably in order that he might be called as a

[1] The title of "Eminence" was first given to cardinals by Pope Urban VIII. in 1630.

[2] See Lorini's Denunciations, fol. 342, Vat. MS. According to Epinois this letter was of the 5th, but Gherardi publishes a document which shows it to have been of the 7th. (Gherardi's Collection of Documents, Doc. ii.)

witness against Galileo, an object which, as we shall see, was attained.

In consequence of this denunciation the Holy Office felt itself called upon at once to institute a secret inquiry about the astronomer. As Lorini had only been able to show a copy of Galileo's letter to Castelli in confirmation of his accusations, it appeared to the Inquisition to be of great importance to obtain possession of the original, written and signed by Galileo. To attain this end the worthy gentlemen acted on the principle that "the end sanctifies the means." Cardinal Mellini, under date of 26th February, ordered the secretary of the Holy Congregation to write to the Archbishop of Pisa and the Inquisitor there, that they were to procure that document "in a skilful manner." On the very next day the order was despatched.[1]

It happened that a few days later Castelli, who had returned from a short stay at Florence to Pisa, paid a visit to the archbishop, Francesco Bonciani. He seized the opportunity of executing his commission. With this end in view he began by adjuring the father, who was quite taken aback by such an exhortation, to give up certain extravagant opinions, particularly that of the revolution of the earth, adding that it would be to his salvation, while to hold them would be to his ruin, for those opinions (*to say nothing of their folly*) were dangerous, repulsive, and mischievous, for they were directly opposed to Holy Scripture. The philosophical arguments with which the archbishop tried to convert Castelli to orthodox astronomy rose to a climax in the profound remark that as all things (*creatura*) had been created for the use and benefit of man, it was obvious that the earth could not move like a star.[2] After giving this affectionate counsel to Castelli he offered the same for Galileo, and declared himself ready to demonstrate to all the world the folly of that

[1] Vat. MS. 347 vo.; also Gherardi's Documents, Doc. ii.

[2] See Castelli's letter to Galileo, 12th March, 1615, in which this visit is described. (Op. viii. pp. 358, 359.)

opinion. But, in order to do it successfully, he must first acquaint himself thoroughly with Galileo's arguments; and, therefore (and now comes the gist of the matter) he urgently begs Castelli to let him see Galileo's apologetic letter.

Fortunately it was no longer in Castelli's possession, for he had returned it to the author. For not only did he not in the least perceive the trap that was laid for him, but was so innocent as to inform Galileo of the request and warmly to second it.[1] But Galileo had suspicions, and delayed to reply. The archbishop was annoyed, and reported in two letters to Rome, of 8th and 28th of March,[2] that Castelli was convinced that he only wanted to see the letter out of curiosity, and as the common friend of both had written to Galileo; still Galileo had not sent it. Bonciani therefore asks "whether he shall be more open with Castelli?" But this time cunning did not attain its end; at the repeated urgency of Castelli,[3] Galileo at last sent him a mere copy without signature, and with the express reservation that he was not to let it go out of his hands. From a letter of Castelli's[4] to Galileo we learn that in obedience to this injunction Castelli read it to the archbishop in presence of several canons, and that he diplomatically concealed his annoyance at the failure of his intrigue, and put a good face on it, for Castelli adds with great satisfaction that the archbishop had highly praised Galileo's demonstrations, and lauded to the ecclesiastics present the modesty and reverence for Holy Scripture therein displayed.

So Cardinal Mellini had to content himself with a copy of Galileo's criminated epistle, to lay before the consultor of the Holy Office for his opinion. He pronounced that some words and phrases occurred in the document that were unsuitable; but, although at first sight they looked ill, they were capable

[1] In the letter before quoted of 12th March.
[2] Marini, pp. 84–86, and Vat. MS. fol. 349, 350.
[3] Op. viii. p. 365.
[4] Op. viii. pp. 369, 370.

of being taken in a good sense, and were not of that nature that they could be said to deviate from Catholic doctrine.[1]

Meanwhile a papal mandate had been issued, under date of 19th March, to summon Caccini as a witness, as being specially well informed about Galileo's errors.[2] He appeared before the holy tribunal the very next day, and eloquently poured forth his accusations; but, although upon oath, he did not adhere very strictly to truth. For not only did he denounce the opinion of Copernicus as *quasi* heretical, being opposed to all scholastic theology and to the customary interpretation of many passages of Scripture, and assert that these doctrines were to be found both in the letter to Castelli and in the purely scientific treatise on the solar spots, but added the far more serious charge that he had heard that Galileo maintained the three following propositions: "God is not a self existent being, but an accident; God is sentient because the Divine sentiments reside in Him; the miracles said to be performed by the saints are not real miracles." He further says that Galileo is at any rate "suspicious in religious matters," because he belongs to "a certain Accadémia dei Lincei," and corresponds with the godless Fra Paolo Sarpi at Venice, and with many dissolute Germans. More absurd deductions from real facts can hardly be conceived. To make a hotbed of heresy out of an academy founded by Prince Cesi, a man of known piety, and to place Galileo's religion in doubt on account of his scientific correspondence with magnates of science like Sarpi, Welser, Kepler, etc., was almost like madness.[3]

In confirmation of his damaging statements Caccini appealed to the testimony of a Dominican, Ferdinand Ximenes, and a young nobleman, Attavanti. Both of them were afterwards called in November of the same year. It then came out that Caccini was not only an eavesdropper but a bad listener.

[1] Vat. MS. fol. 341.

[2] Vat. MS. fol. 352 ro.; and Gherardi's Documents, Doc. iii.

[3] Compare the text of Caccini's evidence. (Vat. MS. fol. 353 ro-358vo.)

Attavanti, who moreover was far more a disciple of the Dominicans than of Galileo, had once had a discussion with Ximenes, in their convent of Santa Maria Novella, about the proposition concerning the nature of the Godhead, but it originated entirely in scholasticism and had nothing to do with Galileo. Caccini, listening behind a partition, caught something of the conversation; and, thinking that Attavanti was a well instructed follower of Galileo, and was merely repeating what he had taught him, explained the fragments of the disputation in his own fashion, and formed them into these stupid accusations. It also appeared from the evidence of Ximenes and Attavanti that neither of them knew of anything suspicious about Galileo, except that he propounded the doctrine of the double motion of the earth.[1]

After the favourable testimony of Ximenes and Attavanti the evidence of Caccini was only so far of importance that it gave rise to an inquiry into the "History and Explanation of the Solar Spots."[2] This, and the oft discussed letter to Father Castelli then, were the grounds upon which Galileo's enemies based the accusation of philosophical and theological error.

[1] See the protocol of both these examinations. (Vat. MS. fol. 371 ro–373 vo.

[2] Vat. MS. fol. 375 vo., and Gherardi's Documents, Doc. v.

CHAPTER V.

HOPES AND FEARS.

Galileo's Fears.—Allayed by letters from Rome.—Foscarini's work.—Blindness of Galileo's Friends.—His Apology to the Grand Duchess Christine.—Effect produced by it.—Visit to Rome.—Erroneous opinion that he was cited to appear.—Caccini begs pardon.—Galileo defends the Copernican system at Rome.—His mistake in so doing.

GALILEO knew no more than the rest of the world of the secret proceedings of the Inquisition against him and his system. He had only discovered that some Dominican monks wanted to make use of his letter to Castelli to effect the condemnation of the Copernican doctrines, and that they were spreading all sorts of calumnies against him based upon it. Fearing that the copy of it on which they relied might have been tampered with, he sent a correct copy on 16th February, 1615, to his sincere friend Mgr. Dini at Rome, with a request that he would forward it to the mathematician, Father Griemberger, and perhaps even to Cardinal Bellarmine. Galileo observed in the accompanying letter that he had written the one to Castelli "*currente calamo*," that since then he had made many researches into the subject therein discussed, and announced the speedy completion of a larger work, in which he should carry out his reasoning far more in detail; as soon as it was finished he would send it to Mgr. Dini. (This was his great Apology to the Grand Duchess Christine.) In conclusion, he bitterly complains that his enemies were daily increasing in number, and, in order to injure him the more, were spreading the strange report among the people that he was the founder of the system of

the double motion of the earth, which gave rise to incidents like that with Bishop Gherardini.[1]

The philosopher, who it is evident was a good deal discomfited, received in reply consolatory assurances from Mgr. Dini and others of his ecclesiastical friends. But they earnestly advised him to treat the subject of the Copernican system purely from the mathematical, physical point of view, and carefully to avoid religious discussion. This hint came rather late in the day, and could not now be of much use to Galileo, when his doctrines were already attacked as heretical, although secretly at that time, and the accusation was based on the purely scientific work on the solar spots. War had been declared with the Copernican system in the name of the Bible.

Galileo's letters to Mgr. Dini of 16th February and 28th March,[2] plainly show how unwillingly he had been driven into the theological field by his opponents. After he had in the second letter decidedly rejected Dini's suggestion that he should treat the Copernican system merely as a hypothesis, he added that it had been his earnest desire to keep strictly to his part as a man of science, and not to be compelled to defend his astronomical system against religious scruples. He entirely agrees with those who say that the task of bringing natural science into agreement with Holy Scripture should be left to theologians, and shows that he has been compelled to defend himself on this dangerous ground. He says besides that his letter to Castelli was not originally intended to go any farther, and regrets that Castelli had had copies made of it without his knowledge.

It is a noteworthy circumstance that at the very time when the secret denunciation had been laid before the tribunal of the Inquisition at Rome, all the letters and reports which Galileo received from Rome, even from trustworthy friends, Mgrs. Dini, Ciampoli, and Prince Cesi, were calculated to allay his anxious fears. None of those persons, although in

[1] Op. ii. pp. 13–17.

[2] Op. ii. pp. 17–26.

influential positions, and likely it would seem to have been better informed, knew, as appears from their correspondence with Galileo, anything of the proceedings which were being instituted at Rome against him and the Copernican system. The Inquisition knew well enough how to keep its secrets. On 28th February[1] Mgr. Ciampoli writes confidently to Galileo that, notwithstanding all the inquiries he had made, he could learn nothing of any measures against him or the new doctrines; he sets down the whole rumour to the incautious talk of some hot-headed fellow.

On 7th March[2] Dini tells Galileo that Cardinal Bellarmine had said "he did not think that the work of Copernicus would be prohibited, and the worst that would happen would be that some addition would be made to it, stating that this theory was only accepted to explain phenomena,[3] or some such phrase, and with this reservation Galileo would be able to discuss the subject whenever he had occasion." Under the same date Prince Cesi tells Galileo that a work had just been published by a Dominican monk, which brilliantly defended the opinion of Copernicus and made it agree with Holy Scripture. He adds that the work could not have appeared more opportunely.[4]

But what seems the most strange are the express and repeated assurances of the cardinals Barberini, Del Monte, and Bellarmine, to Galileo, through Dini and Ciampoli, that so long as he did not go beyond the province of physics and mathematics, nor enter into any theological interpretations of Scripture, he had nothing to fear.[5] How could Cardinal

[1] Op. viii. pp. 350–353. [2] Op. viii. pp. 354–356.

[3] As we should say, "as a working hypothesis." [TR.]

[4] This was the work which was condemned and absolutely prohibited by the Congregation of the Index a year later: "Lettera del R. P. Maestro Paolo Antonio Foscarini, Carmelitano, sopra l'opinione de i Pittagorici e del Copernico della mobilita della Terra e stabilita del Sole, e il nuovo Sisteme del Mondo." (For Cesi's letter, Op. viii. pp. 356–358.)

[5] See Dini's letter to Galileo, March 14th, 1615 (Op. viii. p. 360); and of August 18th, 1615 (Wolynski, "Lettere Inedite," p. 34); and Ciampoli's of March 21st (Op. viii. pp. 366, 367.)

Bellarmine, who had not long before expressly stated to Prince Cesi that the new system was not compatible with the doctrines of Holy Scripture, and who, as a member of the Inquisition, must have been aware of the transactions which had been going on about Galileo since 5th February, give these assurances so directly opposed to the truth? And yet these three prelates afterwards gave many proofs of good will towards Galileo. How then is their ambiguous conduct to be explained? It was simply that they were friendly to Galileo, but not to his doctrines. They certainly desired to shield his person, and afterwards honestly endeavoured to do so even under most difficult circumstances; but the system he defended, which endangered the faith of the Church, must be suppressed at all hazards. In order to this end it appeared advisable to keep it a secret from Galileo that the statement of Copernicus that the earth moved was assailed from the theological standpoint, until the Holy Office had issued the interdict against its circulation and defence. It was thus that they prudently rounded the rocks which the dreaded dialectics of the clever Tuscan had exposed to view.

And the nearer the period was drawing when the verdict of the Church was to be pronounced on the Copernican theory, and the more eagerly the secret inquiries about Galileo were being prosecuted, the more confident became the tone of the letters of his friends from the very city where this ominous web was being woven. It seems as if all Galileo's trusty adherents had been struck with blindness, for we should not be justified in doubting the sincerity of a Dini, a Ciampoli, and a Cesi, men who afterwards proved by their actions their true friendship for the great astronomer. On 20th March the evidence of Caccini was taken, and on the 21st Ciampoli communicates to Galileo the consoling observations of the cardinals Del Monte and Bellarmine mentioned above. Ciampoli also adds to these comforting assurances by telling him that Foscarini's work was no doubt in great danger of being prohibited by the Congregation of

the Holy Office to take place next month, *but only because it meddled with matters concerning Holy Scripture.* He goes on to say with real satisfaction that he can only confirm his previous information, and that all this noise originated with four or five persons who are hostile to Galileo; he and Dini had taken all possible pains to find out this assumed agitation, but had discovered absolutely nothing. He repeats this most decidedly in a letter of a week later;[1] and in another of 16th May[2] he cannot at all understand what has so disconcerted Galileo, and adds that it was no longer doubtful that the Copernican doctrine would not be prohibited, and expresses his conviction that it would be a great satisfaction to every one if Galileo would come to Rome for a time, and the more so because he had heard that many of the Jesuits were secretly of Galileo's opinion, and were only keeping quiet for the present.

A private note enclosed in a letter from Prince Cesi to Galileo, of June 20th, is equally sanguine. He tells him that Foscarini's work, of which a new and enlarged edition is to appear immediately, has had great success at Rome, and that the opponents of Galileo and of the new system are much cast down about it; he adds that neither the author of that treatise nor the doctrines in question are in any danger, if only a little prudence is exercised. Cesi even thinks that the new edition, in which the author refutes all the objections to his work, will satisfy the ecclesiastical authorities, convince opponents, and put an end to the whole business. "Then," continues the prince confidently, "when every difficulty is removed and attack rendered impossible, the doctrine will be so fully permitted and recognised, that everybody who wishes to maintain it will be at liberty to do so, as in all other purely physical and mathematical questions."[3]

This is the last letter we have from Galileo's friends of this period. From this date to the time of his stay in Rome,

[1] Op. viii. p. 368. [2] Op. viii. pp. 376, 377.
[3] Op. viii. pp. 378, 379.

in 1616, there are no letters to him extant. This is the more to be regretted, as the gap occurs at a very interesting juncture. Perhaps after the Copernican doctrines were condemned Galileo may have destroyed this correspondence out of regard for his friends, for it may have contained allusions to very delicate matters.

Meanwhile, after having been repeatedly urged to it by Mgr. Dini,[1] he had completed his great apologetic treatise, in the form of a letter to the Grand Duchess Dowager, Christine. As it accurately defines the standpoint which Galileo desired to take as a natural philosopher and sincere Catholic, with respect to the Church of Rome, it seems necessary to give a sketch of its contents.

Galileo begins with the motive of his Apology. Several years ago he had made many discoveries in the heavens, the novelty of which, and the vast consequences they involve, which are opposed to many of the principles of the modern Aristotelian school, have incensed no small number of professors against him, as if he had placed these phenomena in the heavens with his own hands in order to overturn nature and science. Placing a greater value on their own opinions than on truth, these men had taken upon themselves to deny the existence of these discoveries, whereas if they had only consented to observe them, they would have been convinced. Instead of this, they assailed the new discoveries with empty arguments, and worst mistake of all, interwove them with passages of Scripture which they did not understand. But when the majority of the scientific world was convinced with its own eyes, so that it was impossible any longer to doubt the truth of these phenomena, their opponents tried to consign them to oblivion by obstinate silence; and when that did not avail they took another course. Galileo says that he should pay no more heed to these attacks than to former ones, at which, confident of the final result, he had always laughed, but they seek to cast an aspersion on him which he dreads

[1] See his letter to Galileo, May 16th, 1615. (Op. viii. pp. 376, 377.)

more than death. His opponents, knowing that he favoured the opinion of the double motion of the earth, and thereby attacked the Ptolemaic and Aristotelian principles, and perceiving since the universal recognition of his observations that they could never combat him successfully on the field of natural philosophy, are trying now to make a shield for their false statements out of a fictitious piety and the authority of Holy Scripture. They have therefore first tried to spread the opinion that the views he defends are opposed to the Bible, and therefore heretical and worthy of condemnation. They then easily found some one to denounce them from the pulpit, and he hurled his anathemas not only at the Copernican doctrines, but against mathematicians in general. They also gave out that the modern views of the system of the universe would shortly be pronounced heretical by the highest authorities.

Galileo then points out that Copernicus, the originator of these doctrines, was not only a good Catholic, but a priest highly esteemed by the Roman curia, both for his learning and piety. He had dedicated his famous work: "De Revolutionibus Orbium Cœlestium," to Pope Paul III., and no one had felt any scruples about his doctrines, although some ill-disposed persons want to have the book pronounced heretical, without ever having read, to say nothing of studied it. As an adherent of the Copernican theory, Galileo now feels compelled, in order to justify himself, to discuss in detail these arguments from Scripture brought forward by his opponents, and he hopes to prove that he is animated by a greater zeal for true religion than his adversaries; for he by no means demands that the book should not be condemned, but that it should not be condemned without being understood or even looked at. Before proceeding to discuss these arguments, he protests that he will not only always be ready publicly to rectify the errors he may from ignorance have fallen into on religious matters in this treatise, but that it was not in the least his intention to enter into dispute with

any one on such subjects; it is rather his desire, by these remarks, to incite others to deliberations useful to the Church. As to the decision about the Copernican system, we must bow to the opinions of the ecclesiastical authorities, and should it be adverse to him, let his work be torn up and burnt, for he had neither wish nor intention to promote results that were not catholic and pious.

After this long and cautious introduction, Galileo comes to the matter itself,—the discussion of the principles of exegesis of Scripture with respect to natural science. He employs the same arguments as in his letter to Castelli, only more in detail, and cites several passages from St. Augustine in support of his views, as to how far questions of natural philosophy should be left to the understanding and to science. He also quotes a saying of Cardinal Baronius: "The Holy Spirit intended *to teach us how to go to heaven, and not how the heavens go.*" Galileo then illustrates by examples how derogatory it will be to the dignity of Holy Scripture if every unauthorised scribbler is permitted to adduce passages from it in support of his views, which he often does not interpret rightly; and experience shows the futility of this method of proof. He then turns to the claim of theologians to enforce upon others in scientific discussions opinions which they hold to agree with passages of Scripture, while maintaining that they are not bound to explain the scientific phenomena which are opposed to their decisions. In support of this they affirm that theology is the queen of all the sciences, and need not condescend to accommodate herself to the teachings of other sciences far beneath her: they must submit to her as their sovereign, and modify their conclusions accordingly. This leads Galileo to some considerations which he will here set forth, that he may learn the opinions of others more expert on such questions than he is, and to whose decisions he is always ready to bow.

He is in doubt whether some ambiguity has not crept in

for want of more precision in defining why theology is entitled to be called a queen. It must either be because all that is taught by other sciences is comprised in and explained by theology, only in a higher sense; or because theology treats of a subject which far surpasses in importance all the subjects of which profane science treats. But even the theologians themselves will hardly maintain that the title belongs to theology in the first sense; for no one can say that geometry, astronomy, music, and medicine, are better treated of in Scripture than in the writings of Archimedes, Ptolemy, Boccius, and Galen. It appears then that the royal prerogative of theology must be derived from some other source. Galileo here remarks:—

"If then theology occupies herself solely with the highest problems, maintains her throne by reason of the supreme authority conferred on her, and does not condescend to the lower sciences as not affecting salvation, the professors of theology should not assume authority on subjects which they have not studied. For this is just as if an absolute ruler should demand, without being a physician or an architect, that people should treat themselves, or erect buildings, according to his directions, to the great peril of poor sick people and obvious ruin of the edifices."

Galileo then demonstrates the vast difference between doctrinal and exact sciences, and says that in the latter opinions cannot be changed to order. Supported by the authority of St. Augustine, he maintains that opinions on natural science which have been proved to coincide with actual facts cannot be set aside by passages of Scripture, but these must be explained so as not to contradict the indisputable results of observation. Those, therefore, who desire to condemn an opinion in physics must first show that it is incorrect. But it must be made the subject of close investigation, and then a different result will often be obtained from the one desired. Many learned men who intended to refute the Copernican theory have been changed, by examination, from opponents to enthusiastic defenders of it. In order to banish it from the world, as many desired, it would

not be enough to shut the mouth of any one individual, it would be necessary to prohibit not only the writings of Copernicus and his followers, but astronomy altogether. But to suppress his work now, when new discoveries are daily confirming his theory, after it has been quietly submitted to for so many years, appears to Galileo like opposition to truth itself; and to permit the book and condemn the doctrine would be still more pernicious to the souls of men, for it would allow them the opportunity of convincing themselves of the truth of an opinion which it was a sin to believe. To forbid astronomy altogether would be like rejecting hundreds of passages of Scripture which teach us how the glory of God is revealed in all His works, which are best to be studied in the open book of nature.

Galileo then applies these general principles to the Copernican theory. According to many, it ought to be pronounced erroneous because it is opposed to the apparent meaning of many passages in the Bible, while the opposite opinion is to be believed *de fide*. He sharply defines two kinds of scientific questions: those on which all man's researches can only lead to probability and conjecture, as for instance, whether the stars are inhabited or not; and those on which, by experience, observation, and inevitable deduction, we either have attained certainty or may safely reckon on doing so,—as whether the earth or the heavens move. In the first case, Galileo is decidedly of opinion that it behoves us to be guided by the literal sense of Scripture; in the second, he repeats what he has said before, that two truths can never contradict each other. The Bible speaks of the sun as moving and of the earth as standing still to accommodate itself to the understanding of the people, and not to confuse them, otherwise they might refuse to believe the dogmas which are absolutely *de fide*. For the same reason the fathers have spoken about things not appertaining to salvation, more in accordance with usage than actual facts, and he confirms this by quotations from St. Jerome and St. Thomas.

Even the general agreement of the fathers in the interpretation of any passage of Scripture of scientific import should, in Galileo's opinion, only confer authority on it when the question has been discussed by many fathers with knowledge of both sides. But this is not the case with the question of the double motion of the earth, for it had not come up at all at that time, and it could not occur to the holy fathers to dispute it, for the current opinion was in entire agreement with the literal meaning of the Bible. It was not enough to say that the fathers had all believed that the earth stood still, and that therefore it was to be held *de fide*, for it was very possible that they never investigated it, and only held it as generally current. If they had done so and found it deserving of condemnation, they would have said so, but it had never been discovered that they had. The writings of Diego di Zuñiga show, on the contrary, that when some theologians began to consider the Copernican theory, they did not find it erroneous or contrary to Scripture. Moreover, no argument could be drawn from an unanimous opinion of the fathers, for some of them spoke of the sun as stationary, others of the *primum mobile*.

Galileo declares himself ready to sign an opinion of wise and well informed theologians on the Copernican theory. Since no investigation of it was instituted by the ancient fathers, it might be done now by theologians fitted for it, who, after they had carefully examined all the scientific arguments for and against, would establish on a firm footing what was dictated to them by Divine inspiration. He once more lays great stress on the need of first convincing one's self of the actual facts of nature under the guidance of science, and then proceeding to interpret texts of Scripture. He is indignant with those who, from malice or blinded by party interest, say that the Church should draw the sword without delay, since she possesses the power. As if it was always desirable to do whatever was in our power! He shows that the fathers were not of that opinion, but agreed with him, and

exclaims to these wranglers: "Try first to refute the arguments of Copernicus and his followers, and leave the task of condemning them to those to whom it belongs; but do not hope to find among the fathers, who were as discreet as they were far-seeing, or in the wisdom of Him who cannot err, those hasty conclusions to which you are led by personal interests and passions. It is doubtless true that concerning these and similar statements which are not strictly *de fide*, his Holiness the Pope has absolute authority to approve or condemn; *but it is not in the power of any human being to make them true or false, or other than they de facto are.*"

This lengthy treatise concludes with a disquisition on the passage in the book of Joshua, which he treats in the same way as in the letter to Castelli.

Notwithstanding all the care Galileo exercised in this apology[1] not to give any handle to his enemies, it contained far too many liberal and merely human principles not to do the author more harm than good in the eyes of the orthodox party, both on religious and scientific questions. His opponents saw this plainly enough, and agitated against him all the more vehemently at Rome.

Ominous reports reached the astronomer, who was anxious enough before; but he could not any how learn anything definite about these attacks, only so much eked out, that something was brewing against him, and that it was intended to interdict the Copernican theory. Galileo thought he could best meet these intrigues by his personal appearance at Rome; he wanted to learn what the accusations against him were, and to show that there was nothing in them; he desired energetically to defend the new system, to aid truth in asserting her rights. So, early in December, 1615, provided with cordial letters of introduction from the Grand Duke, he set out for Rome.[2]

[1] Op. ii. pp. 26–64. It did not appear in print until twenty-one years later, in Strasburg.

[2] See the letters of Cosmo II., November 28th, to his ambassador Guic-

Some older authors, and recently Henri Martin,[1] have repeated as a fact the report circulated at the time by Galileo's enemies,[2] that this visit to Rome was by no means so voluntary as he thought fit to give out. Martin appeals in support of this view to a letter of Mgr. Querenghi to Cardinal Alexander d'Este, of 1st January, 1616,[3] in which he says that the philosopher had been *cited* to appear at Rome, that he might explain how he made his doctrines, which entirely contradict Holy Scripture, agree with it. Martin also states that the Tuscan ambassador at Rome, in a despatch of 11th September, 1632, announced that a document had been discovered in the books of the Holy Office, which showed that Galileo had been summoned to Rome in 1616; and finally, this otherwise excellent biographer of Galileo adds some grounds of probability which, however, are not conclusive. Besides, these arguments, in the face of other facts, are not valid. Even if Galileo's contemporary letters from Rome, in which he repeatedly expresses his satisfaction that he had come there,[4] are not relied upon, and are regarded merely as a consistent carrying out of the fiction, his statement on his trial of 12th April, 1633, bears clear witness that Martin is in error. Being asked if he came at that time to Rome of his own accord, or in consequence of a summons, he answered: "In the year 1616 I came to Rome of my own accord, without being summoned."[5] It was impossible that he should then have persisted in the assumed fiction, for he could not have denied

ciardini, at Rome, to Cardinal del Monte, Paolo Giordano Orsini, and Abbot Orsini; also to Cardinal Orsini, of December 2nd. (Wolynski: "La Diplomazia Toscana e Gal. Galilei," pp. 18–20.)

[1] Page 69.

[2] Compare the letters of Sagredo from Venice of 11th March and 23rd April, 1616, to Galileo at Rome. (Op. Suppl. pp. 107–113. Also Nelli, vol. i. p. 414.)

[3] Op. viii. p. 383.

[4] See his letters of 12th Dec., 1615, and 8th Jan., 1616, to the Tuscan Secretary of State, Curzio Picchena, at Florence. (Op. vi. pp. 211, 212, 214, 215.)

[5] Vat. MS. fol. 414 vo.

before the Inquisition a summons issued by itself seventeen years before, since it would certainly have been entered in their registers.[1] According to the statement of the Tuscan ambassador mentioned above, such a document had been discovered *one* year previously in the protocols of the Holy Office. But in the face of the question put at the examination this does not seem very credible. Moreover, in none of the documents now open to historical research relating to the transactions of 1616, is there any such record to be found, nor anything to indicate that this visit of Galileo's to Rome did not originate with himself.

Neither does the flattering reception he met with at all agree with the assumed secret summons. Nevertheless, his correspondence with Picchena, successor in office to Vinta, though very cautious, shows that notwithstanding the comforting assurances he had received from his friends at Rome, he found that a zealous agitation was going on, not only against the doctrines he advocated, but against himself.[2] In another letter of 8th January, 1616, he says he sees every day what a good idea it was to come here, for he had found so many snares laid for him that it would have been quite impossible not to be caught by one or other of them, and he would not have been able to extricate himself for a long time, perhaps never, or only with the greatest difficulty. He is confident that he shall now very soon destroy the traps of his enemies, and be able to justify himself in a way that will bring all their unworthy calumnies to light. They have spread the false report that he was in disgrace at the grand ducal court in consequence of the enormity of his offence, and that the proceedings against him had the Grand Duke's entire approval. Now, as the cordial introductions given him by Cosmo II. proved precisely the contrary, the assertions of his enemies would lose all credit, and he would be believed all

[1] Compare also Wohlwill, p. 86, note 1.

[2] See his letters to Picchena of 26th Dec., 1615, and 1st Jan., 1616. (Op. vi. pp. 213, 214.)

the more, so that he should be able to justify himself completely.[1]

Judging, however, from a letter written fourteen days later to the Tuscan Secretary of State, Galileo had not found it so easy to defend himself as he anticipated. Indeed it seems to have been a very complicated business. A passage from the letter above mentioned will give an idea of it:—

"My business is far more difficult, and takes much longer owing to outward circumstances, than the nature of it would require; because I cannot communicate directly with those persons with whom I have to negotiate, partly to avoid doing injury to any of my friends, partly because they cannot communicate anything to me without running the risk of grave censure. And so I am compelled, with much pains and caution, to seek out third persons, who, without even knowing my object, may serve as mediators with the principals, so that I may have the opportunity of setting forth, incidentally as it were, and at their request, the particulars of my interests. I have also to set down some points in writing, and to cause that they should come privately into the hands of those whom I wish should see them; for I find in many quarters that people are more ready to yield to dead writing than to living speech, for the former permits them to agree or dissent without blushing, and then finally to yield to the arguments used—for in such discussions we have no witnesses but ourselves, whereas people do not so readily change their opinions if it has to be done publicly."[2]

Galileo at length succeeded by his strenuous efforts in freeing himself from all false accusations and in refuting the slanders of Caccini. His affairs took so favourable a turn that the monk found it advisable to pay an obsequious visit of several hours to Galileo, humbly begged pardon for his previous conduct, offered any satisfaction in his power, and assured Galileo that the agitation going on was not in any way to be laid at his door.[3] But he could not refrain from trying to prove that the Copernican doctrines were erroneous, in which however he had no more success than in convincing Galileo of his sincerity, for he wrote to Picchena that he

[1] Op. vi. pp. 215, 216.
[2] 23rd Jan., 1616. (Op. vi. pp. 218, 219.)
[3] Letter to Picchena, 6th Feb. (Op. vi. p. 222.)

had found in Caccini "great ignorance and a mind full of venom."[1]

But Galileo had only performed half his task by the happy adjustment of the difficulties affecting himself; the more important and grander part of it, the preservation of the Copernican system from the interdict of the Church, had yet to be accomplished. His letter of 6th February to Picchena tells him of the favourable turn in his own affairs, as well as of the noble purposes by which he was animated. He writes:—

"My business, so far as it concerns myself, is completed; all the exalted personages who have been conducting it have told me so plainly, and in a most obliging manner, and have assured me that people are fully convinced of my uprightness and honour, and of the devilish malice and injustice of my persecutors. As far as this point is concerned, therefore, I might return home without delay, but there is a question concerning my own cause which does not concern myself alone, but all those who, during the last eighty years, have advocated in printed works or private letters, in public lectures or private conversations, a certain opinion, not unknown to your Grace, on which they are now proposing to pronounce judgment. In the conviction that my assistance may be of use in the investigation of the matter, as far as a knowledge of those truths is concerned which are proved by the science to which I have devoted myself, I neither can nor ought to neglect to render this assistance, while I shall thereby follow the dictates of my conscience and Christian zeal.[2]

This was magnanimous, and Galileo was entitled, as few others were, to appear as the advocate of science. But unfortunately his warm and perhaps too solicitous efforts for the Copernican cause had a result precisely opposite to the one he intended. He was still under the great delusion that the Roman curia must above all things be convinced of the correctness of the Copernican doctrines. He therefore sought out scepticism on the subject everywhere in the eternal city, combated it eagerly and apparently with signal success. In many of the first houses in Rome, such as the Cesarini's, Ghislieri's, and others, he unfolded before numerous audiences

[1] Letter to Picchena. (Op. vi. pp. 225–227.)
[2] Op. vi. pp. 221–223.

his views about the construction of the universe. He always began these discourses by carefully enumerating all the arguments for the Ptolemaic system, and then proved that they were untenable by the telling arguments with which his own observations had so abundantly supplied him ; and as he not seldom added the biting sarcasm of his wit to serious demonstration, thus bringing the laugh on his side, he prepared signal defeats for the orthodox views of nature.[1]

But by this method he obviously took a false standpoint. He would not see that the Romanists cared far more for the authority of Scripture than for the recognition of the laws of nature; that his system, running counter to orthodox interpretation of the Bible, was opposed to the interests of the Church. And as his tactics were founded upon a purely human way of looking at things, and he erroneously imagined that the true system of the universe would be of greater importance, even to the servants of the Church, than her own mysteries, it was but a natural consequence of these false premises that, instead of attaining his end, he only widened his distance from it.

[1] See the letter of Mgr. Queringhi, from Rome, of 20th January, 1616, to Cardinal Alessandro d'Este. (Op. viii. p. 383.)

CHAPTER VI.

THE INQUISITION AND THE COPERNICAN SYSTEM, AND THE ASSUMED PROHIBITION TO GALILEO.

Adverse Opinion of the Inquisition on Galileo's Propositions.—Admonition by Bellarmine, and assumed Absolute Prohibition to treat of the Copernican Doctrines.—Discrepancy between Notes of 25th and 26th February.—Marini's documents.—Epinois's Work on Galileo.—Wohlwill first doubts the Absolute Prohibition.—Doubts confirmed by Gherardi's Documents.—Decree of 5th March, 1616, on the Copernican system.—Attitude of the Church.—Was the Absolute Prohibition ever issued to Galileo?—Testimony of Bellarmine in his favour.—Conclusions.

THE Inquisition, perhaps still incensed by Galileo's active propagandism, even among the learned world of Rome, and by his brilliant defence of the new system, now hastened to bring to a conclusion the transactions which had been going on for a considerable time against it. A decree of 19th February, 1616, summoned the Qualifiers of the Holy Office (they were not judges exactly, but had to give their opinion as experts) and required them to give their opinion on the two following propositions in Galileo's work on the solar spots:—

I. The sun is the centre of the world, and immovable from its place.

II. The earth is not the centre of the world, and is not immovable, but moves, and also with a diurnal motion.[1]

In accordance with the papal decree, these theologians met four days afterwards, at 9 a.m. on 23rd February, and published the result of their deliberations the next day, as follows:—

[1] Che il sole sij centre del mondo, et per consequenza iſmobile di moto locale,

Che la Tẽrra non ẽ centro del mondo, ne iſmobile, ma si move secondo se tutta etia di moto diurno. (Vat. MS. fol. 376 ro.)

The first proposition was unanimously declared to be false and absurd philosophically, and formally heretical, inasmuch as it expressly contradicts the doctrines of Holy Scripture in many passages, both if taken in their literal meaning and according to the general interpretation and conceptions of the holy Fathers and learned theologians.

The second proposition was declared unanimously "to deserve the like censure in philosophy, and as regards theological truth, to be at least erroneous in the faith."[1]

The Vatican MS. reports the further steps taken against Galileo as the chief advocate of the Copernican system, as follows:—

"Thursday, 25th February, 1616. The Lord Cardinal Mellini notified to the Reverend Fathers the Assessors and the Commissary of the Holy Office, that the censure passed by the theologians upon the propositions of Galileo—to the effect particularly that the sun is the centre of the world, and immovable from its place, and that the earth moves, and also with a diurnal motion—had been reported; and His Holiness has directed the Lord Cardinal Bellarmine to summon before him the said Galileo, and admonish him to abandon the said opinion; and in case of his refusal to obey, that the Commissary is to intimate to him, before a notary and witnesses, a command to abstain altogether from teaching or defending this opinion and doctrine, and even from discussing it; and if he do not acquiesce therein, that he is to be imprisoned."[2]

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[1] Sol est centru mundi, et omnino imobilis motu locali;

Censura: Omnes dixerunt dicta propositionē ee stultā et absurdam in Philosophia, et formaliter hereticā, quatenus contradicit expresse sententijs sacre scripture in multis locis. Secundū proprietate verbor, et secundū communē expositionē, et sensū. Sanct. Patr. et Theologor doctor.

Terra non est centr. mundi, nec imobilis, sed secundu se tota, movetur et moto diurno.

Censura: Omnes dixerunt, hanc propositionē recipē eandē censura in Philosophia; et spectando veritatē Theologicā, at minus ee in fide erronea. (Vat. MS. folio 377 ro.)

[2] Die Jovis, 25th Februarij, 1616.

Ill^mus D. Card^lis Millinus notificavit R.R. pp. D.D. Asseos^r et Commiss S^ti Officij, quod relata censura P.P. Theologoru ad propositⁿ Gallilei Mathem^ci, q. Sol sit centrū mundi, et imobilis motu locali, et Terra moveatur et motu diurno; S^mus ordinavit Ill^mo D. Card^li Bellarm^o, ut vocet corā se d^m Galileum, eumq. moneat ad deserendas d^as op̄onem, et si recusaverit

This is followed in the Vatican MS. by a record intended to look like an official report on the course of the proceedings ordained above. Every unbiassed reader will expect to find in it either that Galileo refused to obey the admonitions of the cardinal, and that the Commissary-General of the Inquisition then issued the other strict injunction, or that Galileo immediately submitted, in which case the official of the Inquisition would not have had to interfere. Instead of this we find the following document, couched half in a narrative tone, half like the report of a notary :—

"Friday, the 26th.—At the Palace, the usual residence of the Lord Cardinal Bellarmine, the said Galileo having been summoned and brought before the said Lord Cardinal, was, in presence of the Most Revd. Michael Angelo Segnezzio, of the order of preachers, Commissary-General of the Holy Office, by the said Cardinal warned of the error of the aforesaid opinion, and admonished to abandon it ; and immediately thereafter, before me and before witnesses, the Lord Cardinal Bellarmine being still present, the said Galileo was by the said Commissary commanded and enjoined, in the name of His Holiness the Pope, and the whole Congregation of the Holy Office, to relinquish altogether the said opinion that the sun is the centre of the world and immovable, and that the earth moves ; nor henceforth to hold, teach, or defend it in any way whatsoever, verbally or in writing ; otherwise proceedings would be taken against him in the Holy Office ; which injunction the said Galileo acquiesced in and promised to obey. Done at Rome, in the place aforesaid, in presence of Badino Nores, of Nicosia, in the kingdom of Cyprus, and Augustino Mongardo, from a place in the Abbacy of Rottz, in the diocese of Politianeti, inmates of the said Cardinal's house, witnesses."[1]

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parere, P. Comiss^{o} cora Noto (Notario) et Testibus faciat illi preceptum, ut īo (omnino) abstineat huōi (huiusmodi) doctrina, et oꝑonem docere, aut defendere, seu de ea tractare, si vero nō acquieverit, carceretur. (Vat. MS. folio 378 vo.)

[1] Die Veneris, 26th eiusdem.

In Palatio solite habit^{ne} d^{i} Ill^{mi} D. Card^{lis} Bellarm^{ni} et in mãsionib. Dom^{ci} sue Ill^{me} Idem Ill^{mus} D. Card^{lis} vocato suprad^{to} Galileo, ipsoq. corã D. sua Ill^{ma} exnte (existente) in p̃ntia adm. R. p. Fr̃is Michaelis Angeli Seghitij de Lauda ord. Pred. Comissarij qualis s^{a} officij pred^{m} Galileũ monuit de errore suprad^{to} oꝑonis, et ut illa deserat, et successive, ac icōtinenti in mei &, et Testiū & p̃nte ēt adhuc eodem Ill^{mo} D. Card^{li} suprad^{o} P. Comiss^{o} pred^{to} Galileo adhuc ibidem p̃nti, et Constituto precepit, et ordinavit . . [Here the MS. is defaced. Two words are wanting, the

The discrepancy between this record and that of 25th February is obvious: that says that the Pope had ordered that Cardinal Bellarmine should admonish Galileo to renounce the opinions of Copernicus, and only *in case he should refuse*, was the Commissary to issue the order to him to abstain from teaching, defending, or discussing those opinions. Here in the report of the 26th we read, that "immediately after" the admonition of the cardinal, the Commissary issued this stringent order, and with the significant modification, "nor to hold, teach, or defend it in any way whatsoever." In this report of the proceedings it is not expressly stated whether Galileo at first refused or not, but, according to the wording of the report, it is almost impossible that he could have done so, since it represents that the Cardinal's admonition was followed immediately by the *absolute* prohibition from the Commissary. But such a mode of procedure was by no means in accordance with the papal ordinance, and would rather have been an arbitrary deviation from it.

Until within the last ten years, in all the works, great or small, which treat of Galileo's trial, we find this absolute prohibition which he was said to have received related as an established historical fact. It was the sole legal ground on which the indictment was based against Galileo sixteen years later, and he was condemned and sentenced by his judges by an ostentatious appeal to it. Up to 1850 not a single document had been seen by any of the authors who wrote so confidently of the stringent prohibition of 1616, which confirmed its historical truth. And yet it could but exist among

second might be nome (nomine); the first began with a p (proprie?) but is quite illegible.] S^{mi} D: N. Pape et totius Congreg^{nis} s^{ti} officij, ut suprad^{ta} oponione q. sol sit c$\bar{e}$: trum mundi, et i$\bar{m}$obilis, et Terra moveatur omnino relinquat, nec e$\bar{a}$ de Cetero q^{a}vis m$\tilde{o}$ teneat, doceat, aut defendat, verbo, aut scriptis, a$\bar{l}$s (alias) co$\bar{n}$ ipsu$\bar{m}$ procedetur $\bar{i}$ (in) S^{to} offo., cui precepto Idem Galileus aequievit, et parere promisit. Sub. quib. & actum Rome ubi subra p$\bar{n}$tibus ibid$\bar{e}$ R.D. Badino Nores de Nicosia $\bar{i}$ Regno Cypri, et Augustino Mongardo de loco Abbatie Rose, dioc. Politianen̄ (Poletianensis) familiarib. d^{i} Ill^{mi} D. Card^{lis} Testibus. (Vat. MS. folio 379 ro, 379 vo.)

the inaccessible archives relating to the trial of Galileo, since the Inquisitors relied upon it in 1633, and it was the pole and axis of the famous trial. And what the world had accepted in good faith on the somewhat doubtful veracity of the Inquisition was at length, apparently confirmed by the testimony of Mgr. Marino Marini, prefect of the Vatican Archives. In that year he published at Rome a book entitled, "Galileo e l' Inquisizione, Memorie storico-critiche," which, as the author stated, was founded upon the original documents of the trial. It actually contained many "extracts" from the original protocols; and founded upon documentary materials accessible only to the author, it was encircled with the convenient halo of inviolability. And for nearly twenty years no serious objection was raised to it. Many historians did shake their heads and say that the work of the right reverend gentleman was as much like a glorification of the Inquisition as one egg to another, and some were not much impressed by the author's high-flown assertion that "the entire publication of the documents would only redound to the glory of the Inquisition,"[1] but drily remarked that it was really a great pity that Mgr. Marini had allowed so splendid an opportunity to slip of performing a great service alike to history and the Church, while the frágments produced were of little value to either one or the other. None of this served to refute a single sentence of the apology in question. It became, on the contrary, notwithstanding its obvious partizanship, the chief source for subsequent narratives of the trial. And it could not fail to be so; for even taking this partizanship into account, how could the dates given be doubted? Could any one suspect a misrepresentation of the whole subject? Did suspicions of an arbitrary use and distortion of the documents at the author's command seem justified? Assuredly not. Besides, the papal archivist appealed with apparent scrupulous exactness to the Roman MS. Although, therefore, the light thrown by Marini on the trial of Galileo seemed

[1] Marini, p. 42.

to be one-sided, the correctness of his facts in general admitted of no doubt. Among these the special prohibition of 1616 played a conspicuous part. It is laid before the reader as beyond all question, and fully confirmed by documents. The author, however, prudently refrained from publishing these "documents" verbatim,—the reports of the Vatican MS. of 25th and 26th February. The discrepancy between them would then have come to light. That was to be avoided, and so Marini, by the approved method of rejecting all that did not suit his purpose, concocted from the two reports a story of the assumed prohibition to Galileo so precise as to leave nothing to be desired.[1]

In 1867 Henri de L'Epinois surprised the learned world with his work, "Galilée, son Procès, sa Condemnation d'après des Documents inédits." He reproduced for the first time in full the most important documents which had been at Marini's command. It now came to light how unjustifiably he had used them. Epinois printed the important reports of 25th and 26th February verbatim. But the story of the prohibition of 1616 had so firmly rooted itself in history, that neither Epinois himself nor the next French historian, Henri Martin, who published a comprehensive work on Galileo based on the published documents, thought of disturbing it.

It was not until 1870 that doubts began to be entertained, in Germany and Galileo's own country, simultaneously and independently, of the authenticity of the prohibition of 1616. In Germany it was Emil Wohlwill who first shook this belief after careful and unbiassed investigation of the Roman MS. published by Epinois, by his excellent treatise: "Der Inquisitions Process des Galileo Galilei. Eine Prüfung seiner rechtlichen Grundlage nach den Acten der Römischen Inquisition." (The Trial of Galileo Galilei. An Examination into its Legal Foundation by the Acts of the Roman Inquisition.) And just when German learning was seeking to prove by

[1] Marini, pp. 93, 94, and 141.

keen critical discussion the untenableness of the usual narrative, the document was published in Italy which raised Wohlwill's conjectures to certainty.

Up to 1870 the conclusion that Galileo did not for a moment resist the cardinal's admonition, but submitted at once, could only be drawn, as it was drawn by Wohlwill, partly from the wording of the report of the proceedings of 26th February, 1616, partly from Galileo's sincere Catholic sentiments, for he was to the end, from conviction, a true son of the Church. However much there might be to justify the conclusion, therefore, it was founded only on probability, was confirmed by no documents, and was therefore open to assault. It was attacked by Friedlein in a review of Wohlwill's brochure.[1] But when Friedlein was trying to prove that Galileo must have resisted the cardinal's admonitions, and only submitted to the peremptory threats of the official of the Inquisition, the document had been already published in Italy which placed the question beyond doubt. This is an extract of the protocol of the sitting of the Congregation of the Holy Office of 3rd March, 1616, and forms part of the collection of documents published by Professor Silvestro Gherardi in the *Rivista Europea*, 1870. It is as follows :—

"*3rd March*, 1616.

"The Lord Cardinal Bellarmine having reported that Galileo Galilei, mathematician, had in terms of the order of the Holy Congregation been admonished to abandon (deserendam) [disserendam (discuss) was the word originally written] the opinion he has hitherto held, that the sun is the centre of the spheres and immovable, and that the earth moves, and had acquiesced therein ; and the decree of the Congregation of the Index having been presented, prohibiting and suspending respectively the writings of Nicholas Copernicus (De Revolutionibus orbium cœlestium. . .) of Diego di Zuñiga on Job, and of Paolo Antonio Foscarini, Carmelite

[1] In the *Zeitschrift für mathematischen u. naturwissenschaftlichen Unterricht*, 1st series, part iv., pp. 333–340. See the controversy between Dr. Wohlwill and Dr. Friedlein in the *Zeitschrift für Mathematik*, etc., 17th series. Part ii., pp. 9–31 ; part iii., pp. 41–45 ; part v., pp. 81–98.

Friar—His Holiness ordered this edict of prohibition and suspension respectively, to be published by the Master of the Palace." [1]

This document, as Gherardi justly perceived, is of far greater importance than merely for the evidence it affords that Galileo at once submitted to the Cardinal's admonition ; it permits the conclusion, almost to a certainty, that a proceeding like that described in the note of 26th February never took place. It is clear from the above that Cardinal Bellarmine was giving a report of the proceedings of 26th February at a private sitting of the Congregation of the Holy Office under the personal presidency of the Pope. His report agrees precisely with the papal ordinance of 25th February : he had admonished Galileo to give up the Copernican doctrines, and he had consented. This was to all appearance the end of the business. The cardinal does not say a word about the stringent proceedings said to have taken place in his presence before notary and witnesses. And yet this part of it would have been of far greater importance than the first. It may perhaps be said that it was not the cardinal's business to report the doings of the Commissary of the Inquisition. But the objection is not valid ; for in the first place the conditions did not exist which would have justified the interference of the Commissary, and in the second, his report would certainly also have been given at the sitting where the proceedings of 26th February were reported. But in the note of 3rd March there is not a trace of the report of Brother Michael Angelo

[1] *Feria V. die III. Martii*, 1616.

Facta relatione per Illumum. D. Card.em. Bellarminum quod Galilaeus Galilei mathematicus monitus de ordine Sacrae Congregationis ad deserendam (prima stava scritto chiarissimamente, *disserendam*) opinionem quam hactenus tenuit quod sol sit centrum spherarum, et immobilis, terra autem mobilis, acquievit ; ac relato Decreto Congregationis Indicis, qualiter (o, variante, quod) fuerunt prohibita et suspensa respective scripta Nicolai Cupernici (De revolutionibus orbium cœlestium . . . .) Didaci a Stunica, in Job, et Fr. Pauli Antonii Foscarini Carmelitæ, SSmus. ordinavit publicari Edictum, A. P. Magistro S. Palatii hujusmodi suspensionis et prohibitionis respective. (Gherardi's Documents, Doc. vi.)

Segnitius de Lauda. It is, however, so incredible that no communication should be made to the Congregation about the most important part of the proceedings of 26th February, and that Cardinal Bellarmine should not have made the slightest reference to it in his report, that this document of 3rd March, 1616, discovered by Professor Gherardi, would be sufficient of itself to justify the suspicion that the course of the proceedings on 26th February, 1616, was not at all that reported in the note relating to it in the Vatican MS., but was in accordance with the papal ordinance of 25th February, and ended with the cardinal's admonition.

Let us see now whether the ensuing historical events agree better with this suspicious note. Two days after the sitting of 3rd March, in accordance with the order of Paul V., the decree of the Congregation of the Index on writings and books treating of the Copernican system was published. It ran as follows :—

"And whereas it has also come to the knowledge of the said Congregation, that the Pythagorean doctrine—which is false and altogether opposed to Holy Scripture—of the motion of the earth, and the quiescence of the sun, which is also taught by Nicholas Copernicus in *De Revolutionibus orbium Cœlestium*, and by Diego di Zuñiga in (his book on) Job, is now being spread abroad and accepted by many—as may be seen from a certain letter of a Carmelite Father, entitled, *Letter of the Rev. Father Paolo Antonio Foscarini, Carmelite, on the opinion of the Pythagoreans and of Copernicus concerning the motion of the earth, and the stability of the sun, and the new Pythagorean system of the world, at Naples, printed by Lazzaro Scorriggio*, 1615 : wherein the said father attempts to show that the aforesaid doctrine of the quiescence of the sun in the centre of the world, and of the earth's motion, is consonant with truth and is not opposed to Holy Scripture. Therefore, in order that this opinion may not insinuate itself any further to the prejudice of Catholic truth, the Holy Congregation has decreed that the said Nicholas Copernicus, *De Revolutionibus orbium*, and Diego di Zuñiga, on Job, be suspended until they be corrected; but that the book of the Carmelite Father, Paolo Antonio Foscarini, be altogether prohibited and condemned, and that all other works likewise, in which the same is taught, be prohibited, as by this present decree it prohibits, condemns, and suspends them all respectively. In witness whereof the present decree has been signed and sealed with the hands and with the seal of the most eminent and Reverend

Lord Cardinal of St. Cecilia, Bishop of Albano, on the 5th day of March, 1616.[1]

In this decree, as is strikingly pointed out by Emil Wohlwill, a distinction is drawn between two classes of writings: those which advocate the positive truth of the Copernican system—which are absolutely interdicted and condemned; and those to which, by some modifications, a hypothetical character can be given—these are to be suspended until the needful corrections have been made. This indicated the precise attitude which the Church thought to take with regard to the Copernican system. As a mere working hypothesis it was *not* dangerous to the Roman Catholic religion; but as irrefragable truth it shook its very foundations. They were, therefore, determined at Rome that it should not make way as truth—it was to be tabooed, banished, and if possible stifled; but as a mathematical hypothesis, the use of which was obvious even to the Romish *savans*, it might be allowed to stand. The cardinal's admonition and the decree are in logical agreement with this intention. Galileo was to "renounce" the opinions of Copernicus, that is he was not to maintain them as established fact; as a hypothesis, like the rest of the world he might retain them. But according to the document of 26th February, entire silence was enjoined upon Galileo upon the subject of the double motion of the earth, for in the injunction neither to hold, teach, or defend it in any way (*quovis modo*), the hypothetical treatment was obviously included.

Perhaps it may be said that they wanted to get rid of the most distinguished and therefore most dangerous defender of the Copernican system, who by his telescopic discoveries had made the controversy a burning question of the day. But this conjecture does not stand the test of close investigation, for Galileo's work on the solar spots, which was based upon the sun's being stationary, was not placed upon the index of forbidden or suspicious books. And in all the proceedings

[1] See this decree in full, Appendix, p. 345.

of the curia against him at that period, the friendly feeling for him personally, of powerful patrons in the Church, is obvious, and it makes any specially rigorous action against him very improbable. We have also other indications that this categoric prohibition to Galileo had not then been, *de facto*, issued.

His letters of this epoch afford the strongest evidence. We cannot expect to find in them precise information about the proceedings of 26th February, as it was contrary to the rules of the Inquisition to make public its secret orders, under the severest penalties; but they contain no trace of the deep depression which would have been caused by the stringent orders of the Holy Office against him personally. On the contrary, he writes on the 6th March (the day following the issue of the decree) to Picchena: "I did not write to you, most revered sir, by the last post, because there was nothing new to report; as they were about to come to a decision about that affair which I have mentioned to you *as a purely public one, not affecting my personal interests*, or only so far as my enemies very inopportunely want to implicate me in it." He goes on to say that he alludes to the deliberations of the Holy Office about the book and opinions of Copernicus; and mentions with evident satisfaction, that the purpose of Caccini and his party to have that doctrine denounced as heretical and contrary to the faith had not been attained, for the Holy Office had simply stated that it did not agree with Holy Scripture, and therefore only prohibited the books which maintained, *ex professo*, that the Copernican doctrine was not contrary to the Bible. Galileo then tells him more particularly what the decree contained, and that the correction of the works of Copernicus and Zuñiga was entrusted to Cardinal Gaetaori. He emphatically states that the alterations will be confined to such passages as aim to prove the agreement of the modern system with Scripture, and "here and there a word, as when Copernicus calls the earth a star." He adds: "I have, as will be seen from the nature of the case,

no interest in the matter, and, should not, as I said before, have troubled myself about it, had not my enemies drawn me into it." He means by this that the prohibition to try and make the doctrine of the double motion square with Scripture was indifferent to him; he would never have concerned himself with theology if he had not been driven to it. He then goes on: "It may be seen from my writings in what spirit I have always acted, and I shall continue to act, so as to shut the mouth of malice, and to show that my conduct in this business has been such that a saint could not have shown more reverence for the Church nor greater zeal." [1]

In the next letter to Picchena, six days later, Galileo repeats what he has said about the correction of the work of Copernicus, and says emphatically that it is clear that no further restrictions will be imposed. From a reply from Galileo's faithful friend, Sagredo, to letters unfortunately not extant, it is evident that he had by no means expressed himself as cast down by the issue of the affair. Sagredo writes in the best of spirits: "Now that I have learnt from your valued letters the particulars of the spiteful, devilish attacks on and accusations against you, and the issue of them, which entirely frustrates the purposes of your ignorant and malicious foes, I, and all the friends to whom I have communicated your letters and messages, are quite set at rest." [2]

It is clear, then, from Galileo's correspondence, that he took the decree of the Inquisition pretty coolly, and speaks with satisfaction of the trifling alterations to be made in Copernicus's work. How could the man, who was forbidden to "hold, teach, or defend" the repudiated doctrine "in any way," write in this style?

A document issued by Cardinal Bellarmine himself, relating to these transactions, is of the utmost importance to the assertion that no such prohibition had ever been issued

[1] Op. vi. pp. 231–233. [2] Op. Suppl. 109–112.

to Galileo. After the publication of the decree of 5th March he remained three months at Rome. His enemies took advantage of this to spread a false report that he had been obliged formally to recant, and absolutely to abjure his opinion. Galileo seems to have been indignant at this; he pacified his adherents who sent anxious inquiries to their master, and complained bitterly of the unscrupulousness of his enemies, for whom no means of injuring him were too bad. But in order to confute these calumnies and guard himself against them in future, before leaving Rome he begged a certificate from Cardinal Bellarmine to prove the falsity of this perfidious fiction. This dignitary consented, and wrote the following declaration :—

"We, Robert Cardinal Bellarmine, having heard that it is calumniously reported that Signor Galileo Galilei has in our hand abjured, and has also been punished with salutary penance, and being requested to state the truth as to this, declare, that the said Signor Galileo has not abjured, either in our hand, or the hand of any other person here in Rome, or anywhere else, so far as we know, any opinion or doctrine held by him, neither has any salutary penance been imposed upon him; but only the declaration made by the Holy Father and published by the sacred Congregation of the Index, has been intimated to him, wherein it is set forth that the doctrine attributed to Copernicus, that the earth moves round the sun, and that the sun is stationary in the centre of the world, and does not move from east to west, is contrary to the Holy Scriptures, and therefore cannot be defended or held. In witness whereof we have written and subscribed these presents with our hand this 26th day of May, 1616."[1]

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[1] Noi Roberto Cardinale Bellarmino havendo inteso che il Sig[r] Galileo Galilei sia calumniato, ò imputato di havere abiurato in mano nra, et anco di essere stato perciò penitenziato di penitenzie salutari; et essendo ricercati della verità diciamo, che il suddetto S. Galileo no ha abiurato i mano nr[a] nè di altra qua in Roma ne meno i[n] altro luogo che noi sappiamo alcuna sua opinione o dottrina, nè manco hà ricevuto penitenzie salutarj, nè d' altra sorte, ma solo, ql'è stata denunziata la dichiara-zione fatta da N[r]o Sig[r], e publicata dalla Sacra Congreg[ne] dell' indice, nella quale si cotiene che la dottrina attribuita al Copernico che la terra si muova intorno al sole, e che il sole stia nel centro del Mõdo senza muoversi da oriente ad occidente sia cottraria alle sacre scritture, e però nõ si possa difendere nè tenere. Et in fede di ciò habbiamo scritta, e sotto-scritta

Wohlwill has clearly shown the discrepancies between this document and that of 26th February; he has pointed out that even if, as Martin thinks, "the secrets of the Inquisition had to be kept at any price, even at the expense of truth,"[1] it would not have put forth so downright a lie in *optima forma* as the cardinal's testimony contained, if the assumed prohibition had really been given to Galileo by the Commissary-General of the Inquisition. This prohibition might easily have been passed over in silence, while the calumnious reports might have been refuted. But the cardinal was not content with that, and stated expressly that Galileo had "only" been personally informed of the decree of the Congregation of the Index about the Copernican system. While this attestation of Bellarmine's glaringly contradicts the second part of the note of 26th February, it not only entirely accords with the papal ordinance of the 25th, but also with Bellarmine's report of the proceedings of 26th February in the private sitting of the Congregation of 3rd March. This proves that the cardinal certified nothing more nor less than what had actually taken place. It leads therefore to the following conclusions:—

1. Galileo did not receive any prohibition, except the cardinal's admonition not to defend nor hold the Copernican doctrine.

2. Entire silence on the subject was therefore not enjoined upon him.

3. The second part of the note in the Vatican MS. of 26th February, 1616, is therefore untrue.

These three facts are indisputable, and the subsequent course of historical events will confirm them step by step, while it can by no means be made to tally with the assumed strict injunction of the Commissary-General. Next however,

la presẽte di nr̃a propria mano questo di 26 di Maggio, 1616. Il medesimo di sopra, Roberto Card.l Bellarmino. (Vat. MS., 423 ro and 427 ro.)

[1] Martin, pp. 79, 80.

the question immediately arises, Through whose means did the falsehood get into the acts of the trial, and was it *bona* or *mala fide?* Historical research can only partially answer this question. All these notifications were entered by a notary of the Inquisition, and probably that of 26th February, 1616, also. Did he, perhaps merely from officious zeal, enter a note of an official proceeding as having actually taken place, which undoubtedly was to have taken place under certain circumstances, but in their absence did not occur, or even were not to be permitted at all in consequence of papal instructions? Or was the notary simply the tool of a power which had long been inimical to Galileo, and which, incensed at the failure for the time of its schemes against him, sought to forge secret fetters for future use by the entry of the fictitious note? We have no certain knowledge of the motives and influences which gave rise to the falsification; as however we can scarcely believe in the officious zeal of, or independent falsification by, the notary himself, the conjecture gains in probability that we are concerned with a lying, perfidious trick of Galileo's enemies,[1] which, as we shall see later on, signally fulfilled its purpose.

Wohlwill, Gherardi, Cantor, and we ourselves have long been of opinion that this note originated, not in 1616, but in 1632, in order to legalise the trial of Galileo. But after having repeatedly and very carefully examined the original acts of the trial, preserved among the papal secret archives, we were compelled to acknowledge that the material nature of the document entirely excludes the suspicion of a subsequent falsification.[2] The note was not falsified in 1632; no, in 1616 probably, with subtle and perfidious calculation, a lie was entered which was to have the most momentous consequences to the great astronomer.

[1] Prof. Riccardi has stated this conjecture in the Introduction (p. 17) to his valuable collection of documents relating to the trial of Galileo, published in 1873.

[2] For the particulars, see Appendix, "Estimate of the Vat. MS."

CHAPTER VII.

EVIL REPORT AND GOOD REPORT.

Galileo still lingers at Rome.—Guiccardini tries to effect his recall.—Erroneous idea that he was trying to get the Decree repealed.—Intrigues against him.—Audience of Pope Paul V.—His friendly assurances.—His Character.—Galileo's return to Florence.

GALILEO had humbly submitted, had witnessed the issue of the decree of 5th March by the august council; he knew that the only correct doctrine of the system of the universe had been reduced to the shadow of a hypothesis, and yet he could not make up his mind to leave the capital of the hierarchy where such a slap in the face had been given to science. The story told in most works on Galileo, that though he had submitted to the Holy Office he afterwards used his utmost endeavours to effect a reversal of the decree, is another of the firmly rooted and ineffaceable mistakes of history. It originated in the reports of the Tuscan ambassador, Guiccardini, to the Grand Duke.[1]

This diplomatist, who was no great friend of Galileo's, found himself in an awkward position; he had been, on the one hand, enjoined by his sovereign to support Galileo as far as it lay in his power, while on the other he knew that the influential female members of the house of Medici were very anxious to maintain the good relations of Tuscany with the Holy See; and he tried to extricate himself from this dilemma by urgently seeking to effect the recall of the inconvenient guest to Florence. This object runs through all the ambas-

[1] Pietro Guiccardini had relieved his predecessor, Giovanni Sicculini, of his post on 14th May, 1611, when Galileo was still at Rome. Guiccardini remained there till 27th November, 1621.

sador's despatches to Cosmo II. He could not depict in colours too glaring the passion, fanaticism, and pertinacity with which, in spite of all advice to the contrary, Galileo defended the Copernican cause at Rome, though he was thereby doing it more harm than good. The long report of Guiccardini to the Grand Duke, of 4th March, 1616,[1] held to be authentic by most of Galileo's biographers, is couched in this tone. Among other things a dramatic scene is narrated which was the immediate cause of the condemnation of the Copernican system. Cardinal Orsini, one of Galileo's warmest friends, to whom the Grand Duke had sent an autograph letter of introduction, had spoken to the Pope in favour of Galileo in the consistory of 2nd March. The Pope replied that it would be well if he would persuade Galileo to give up this opinion. Orsini then tried to urge the Pope further, but he cut him short, saying that he had handed over the whole affair to the Holy Office. No sooner had Orsini retired than Bellarmine, the celebrated Jesuit theologian, was summoned to the Pope, and in the conversation that ensued it was determined that this opinion of Galileo's was erroneous and heretical.

Guiccardini must have been greatly misinformed to send reports so incorrect to his court. As we have seen, on 19th February the Qualifiers of the Holy Office were summoned to pronounce an opinion on the Copernican doctrines, and as the result Galileo was summoned seven days later to appear before Bellarmine, who informed him of the decree, and admonished him to renounce the prohibited doctrine. But all this seems to have escaped the acuteness of the Tuscan ambassador. He supposes that the catastrophe had been brought about by a fit of papal anger! On 4th March he only knows what was known the next day to all the world —by the decree of the Congregation of the Index—that the writings of Copernicus and other authors on the subject of the double motion were to be partly condemned, partly corrected, and partly prohibited.

[1] Op. vi. pp. 227–230.

Guiccardini in this despatch represented, on the one hand, the difficulties into which the imprudent astronomer "might" bring himself by his vehemence, and on the other the embarrassment in which those who took his part would be placed; he reminded the Grand Duke of the attitude which his house had at all times assumed in the past towards such attacks on the Church of God, and of the services it had rendered to the Inquisition, adding that he "could not approve that we should expose ourselves to such annoyances and dangers without very good reason, and a different prospect from that of great damage." The most potent argument, however, which he saved for the close of his long epistle of 4th March, as the climax, was the endeavour to inspire Cosmo II. with the fear that his brother, Cardinal Carlo de' Medici, who was just coming to Rome, would compromise himself by his relations with Galileo.

From Galileo's correspondence with Picchena, we learn in contradiction to this despatch what it was that induced him to linger at Rome after the issue of the decree of 5th March. He did not wish to return to Florence under the impressions produced by the alarming reports of Guiccardini and the rumours spread by many of his opponents. It is evident that he was aware of what was said of him from a passage in a letter to Picchena of 6th March. After expressing a fear that "somebody not friendly to him might represent his affairs to the Tuscan Secretary of State and others in a false light, he entreats Picchena to maintain, until his return, the good opinion of him which his sincerity deserves. He is convinced that the arrival of Cardinal de' Medici will relieve him from the need of uttering one word of self-justification, as he will hear at once what an excellent reputation he enjoyed at the Court of Rome. He then goes on, as if directly refuting Guiccardini's accusations :—

"Then your Grace will learn, above all, with what composure and moderation I have conducted myself, and what regard I have had for the honour and good repute of those who have eagerly tried to injure mine

and certainly your Grace will be surprised. I say this to you, most honoured sir, in case any false accusations of the kind should reach your ears from any quarter; and I hope that credit will be given to a party not adverse to me, so that a more just understanding may be arrived at."

Meanwhile Galileo's position became more favourable, because the Pope received the submissive philosopher very graciously on 11th March, and gave him an audience which lasted three-quarters of an hour. He seized the opportunity of speaking to Paul V. of the intrigues of his enemies, and of some of the false accusations against him; to which the Pope replied that he was well aware of the rectitude and sincerity of his sentiments. And when Galileo, in conclusion, expressed his fears of the perpetual persecutions of relentless malice, the Pope consoled him by saying that he need not fear, for he was held in so much esteem by himself and the whole Congregation, that they would not listen to these calumnies, and as long as he occupied the chair of St. Peter, Galileo might feel himself safe from all danger. Paul V. also repeatedly expressed his readiness to show his favour by his actions.

Galileo hastened on the very next day to make known the favourable result of this audience to Picchena, the Secretary of State, in a long letter.[1] The effect of it, however, was quite different from what he probably expected. The Court of Tuscany, which had been not a little disquieted by Guiccardini's alarming despatch, thought it a good opportunity to press upon Galileo, now that his fame was so brilliantly re-established, to leave Rome and return to Florence. This was the tenor of Picchena's reply of 20th March.[2] Their highnesses, evidently still under the impression of Guiccardini's letter, implored Galileo to be quiet, and no longer to discuss this dangerous subject, but to return.

Encouraged by the Pope's friendly words, however, Galileo

[1] See Galileo's letter to Picchena, from Rome, of 12th March. (Op. vi. pp. 233–235.)

[2] Wolynski's "Lettere inedite," etc., p. 36.

showed no disposition to take these plain hints, and we learn from his further correspondence that his tarriance at Rome was fully approved by the Tuscan Court. Thus we read in a letter of 26th March: "As to my return, unless his Highness wishes it otherwise, I shall, in accordance with your commands, await the arrival of his Reverence the Cardinal." And further on: "After the arrival of the Cardinal I shall stay here as long as his Highness or the Cardinal pleases." [1]

To the great annoyance of Guiccardini, Galileo remained three months longer at Rome—beneath those skies which, according to the ambassador, must prove dangerous to him in consequence of his vehement temperament, "especially at a time when the ruler of the eternal city hates science and polite scholars, and cannot endure these innovations and subtleties." This portrait of Paul V. was undoubtedly a correct one. He cared very little for learning, and displayed a harsh and sometimes savage character; while the inviolability of the dogmas of the Church, ecclesiastical privileges, and blind obedience to the faith, were supreme in his eyes. We will just remind our readers that it was Paul V. who, just after his elevation to the papacy, had a poor wretch, named Piccinardi, beheaded, because, for his private amusement, he had written a biography of Clement VIII., in which he was not very aptly compared with the Emperor Tiberius, although the work was not intended for publication,—a sentence which occasioned great consternation.

At a time, therefore, when the tiara was worn by a man of this character, the atmosphere of Rome might certainly have been dangerous to an ardent explorer in the fields of natural science. But as Galileo did not suffer any sort of papal persecution during his stay there, it is obvious that the character drawn of him by Guiccardini was very much exaggerated. This also refutes the constantly reiterated fable that Galileo was eagerly trying to get the decree of 5th March repealed. The vehement agitation imputed to him by

[1] Op. vi. pp. 235–237.

the ambassador, and this bold attempt, would have been speedily followed by penalties. But history knows nothing at this period of misunderstandings between Galileo and the Church; indeed we possess a document which entirely contradicts the reports of Guiccardini. This is a letter from Cardinal del Monte to the Grand Duke at the time of Galileo's departure from Rome, written expressly "to bear witness that he was leaving with the best reputation and the approval of all who have had transactions with him; for it has been made manifest how unjust the calumnies of his enemies have been." The cardinal adds, "that having conversed much with Galileo, and being intimate with those who were cognisant of all that had taken place, he could assure his Highness that there was not the least imputation attaching to the philosopher."[1]

But to return to the course of events. The Tuscan ambassador continued to send disquieting letters to the Grand Duke about Galileo in order that he might be recalled. He wrote in a despatch of 13th May: ". . . Galileo seems disposed to emulate the monks in obstinacy, and to contend with personages who cannot be attacked without ruining yourself; we shall soon hear at Florence that he has madly tumbled into some abyss or other."[2]

Cosmo II., not a little alarmed by these gloomy prognostications of his ambassador, and really in care for the revered philosopher, at length issued the order for his long-desired return. Picchena then wrote the following drastic letter to Galileo, on 23rd May:—

"You have had enough of monkish persecutions, and know now what the flavour of them is. His Highness fears that your longer tarriance at Rome might involve you in difficulties, and would therefore be glad if, as you have so far come honourably out of the affair, you would not tease the sleeping dog any more, and would return here as soon as possible. For

[1] Op. viii. p. 385.

[2] Op. vi. p. 238, note 2. See these despatches verbatim in Wolynski's "La Diplomazia Toscana e Gal. Galilei," p. 22.

there are rumours flying about which we do not like, and the monks are all powerful. I, your servant, would not fail to warn you, and to inform you, as in duty bound, of the wishes of our ruler, wherewith I kiss your hand." [1]

Galileo complied without delay with Cosmo's wishes, and set out on his homeward journey on the 4th of the following month.

[1] Op. vi. p. 238, note 2.

CHAPTER VIII.

THE CONTROVERSY ON COMETS.

Studious Seclusion.—Waiting for the Correction of the Work of Copernicus.—Treatise on Tides.—Sends it to Archduke Leopold of Austria.—The Letter which accompanied it.—The three Comets of 1618.—Galileo's Opinion of Comets.—Grassi's Lecture on them.—Guiducci's Treatise on them inspired by Galileo.—Grassi's "Astronomical and Philosophical Scales."—Galileo's Reply.—Paul V.—His Death.—Death of Cosmo II.—Gregory XV.—"Il Saggiatore" finished.—Riccardi's "Opinion" on it.—Death of Gregory XV.—Urban VIII.

SEVEN years passed by, during which Galileo lived a secluded and studious life in the Villa Segni, at Bellosguardo, near Florence, without publishing any new work. How could he do so? The acceptance and further application of the Copernican system was the mainspring of all his scientific pursuits, of which, multifarious as they were, the principle of the double motion of the earth was both foundation and keystone. The general permission to employ the theory as a working hypothesis was of little service to him. The lofty structure of correct knowledge of our universe could not be raised on a pedestal of sand; it required the imperishable marble of truth. Galileo was compelled to withhold the results of his researches until, perchance, some altered state of things should change the mind of the papal court, at present so inimical to the Copernican cause. The publication of any researches in accordance with the Copernican system appeared especially dangerous, until the promised corrections had been made in the famous work of the Canon of Frauenburg, which had been temporarily placed on the Index. These corrections would give more

precise information as to how they wished the new doctrine handled at Rome, what limits had been set by ecclesiastical despotism to researches into nature. Galileo watched with great anxiety the labours of the papal censors, and tried to hasten them through his friend Prince Cesi.[1] This eager interest in the earliest possible publication of the corrections is another thing which does not accord with the assumed stringent prohibition of February 26th. What difference would it have made to Galileo whether any facilities were offered for the discussion of the Copernican theory or not, if absolute silence on the subject had been enjoined on him?

During this period, when he could not venture to have the results of his various researches published, he was careful to make them known to some friends of science by means of long letters, numerous copies of which were then circulated in Europe. Very few of them, unfortunately, have come down to us, but there is one of them that deserves special notice. It indicates precisely Galileo's position: on the one hand he feels constrained to make way for the recognition of the truth; but on the other, as a good Catholic, and from regard to his personal safety, he does not wish to clash with ecclesiastical authority. This letter, too, adds weight to the conclusion *that there was no prohibition enjoining absolute silence on the Copernican theory on Galileo.*

During his last stay at Rome, at the suggestion of Cardinal Orsini, he had written a treatise on the tides in the form of a letter to that dignitary, dated January 8th,[2] in which he expressed his firm conviction, erroneously as we now know, that this phenomenon could only be explained on the theory of the double motion of the earth. He represented it as an important confirmation of the truth of it. In May, 1618, he sent a copy of this treatise to the Archduke Leopold of Austria, who was friendly to him, and was a brother of the Grand Duchess. But as since it was written the decree

[1] See letter from Cesi to Galileo. (Op. viii. pp. 389, 390.)

[2] Op. ii. pp. 387–406.

of March 5th had been issued, which only permitted discussion of the subject as a hypothesis, Galileo thought it advisable to add a sort of accompaniment to his treatise, in which he took the utmost pains to comply with the conditions imposed by the Church on her dutiful and orthodox son. He wrote:—

"With this I send a treatise on the causes of the tides, which I wrote rather more than two years ago at the suggestion of his Eminence Cardinal Orsini, at Rome, at the time when the theologians were thinking of prohibiting Copernicus's book and the doctrine enounced therein of the motion of the earth, which I then held to be true, until it pleased those gentlemen to prohibit the work, and to declare that opinion to be false and contrary to Scripture. Now, knowing as I do, that it behoves us to obey the decisions of the authorities, and to believe them, since they are guided by a higher insight than any to which my humble mind can of itself attain, I consider this treatise which I send you merely to be a poetical conceit, or a dream, and desire that your Highness may take it as such, inasmuch as it is based on the double motion of the earth, and indeed contains one of the arguments which I have adduced in confirmation of it. But even poets sometimes attach a value to one or other of their fantasies, and I likewise attach some value to this fancy of mine. Now, having written the treatise, and having shown it to the Cardinal above-mentioned, and a few others, I have also let a few exalted personages have copies, in order that in case any one not belonging to our Church should try to appropriate my curious fancy, as has happened to me with many of my discoveries, these personages, being above all suspicion, may be able to bear witness that it was I who first dreamed of this chimera. What I now send is but a fugitive performance; it was written in haste, and in the expectation that the work of Copernicus would not be condemned as erroneous eighty years after its publication. I had intended at my convenience, and in the quiet, to have gone more particularly into this subject, to have added more proofs, to have arranged the whole anew, and to have put it into a better form. But a voice from heaven has aroused me, and dissolved all my confused and tangled fantasies in mist. May therefore your Highness graciously accept it, ill arranged as it is. And if Divine love ever grants that I may be in a position to exert myself a little, your Highness may expect something more solid and real from me." [1]

On reading such passages one really does not know which to be the most indignant at,—the iron rule by which a privileged caste repressed the progress of science in the

[1] Op. vi. pp. 278–281.

name of religion, or the servility of one of the greatest philosophers of all times in not scorning an unworthy subterfuge in order to disseminate a grain of supposed truth in the world without incurring personal danger.

But in spite of all precautions, in spite of "chimeras," "fictions," "fantasies," and even "the voice from heaven," the circulation of this treatise, based upon the theory of the double motion, would have been an infringement of the assumed absolute prohibition to Galileo, while, thanks to the ingenious accompaniment, it in no way clashed with the decree of 5th March. Galileo's conduct shows plainly enough that he humbly submitted to the ecclesiastical ordinance, but there is not a trace of the prohibition to discuss the doctrine "in any way."

Little, however, as Galileo desired to engage, thus hampered, in any perilous controversies, the next time it was nature herself who enticed him into the field in which his genius and his polemical ingenuity acquired for him both splendid triumphs and bitter foes.

In August, 1618, three comets appeared in the heavens, and the brilliant one in the constellation of the Scorpion strongly attracted the attention of astronomers. Although it was visible until January, 1619, Galileo had very little opportunity of observing it, as he was confined to his bed by a severe and tedious illness.[1] But he communicated his views on comets to several of his friends, and among others to the Archduke Leopold of Austria, who had come to see the sick philosopher.[2] He did not consider them to be real heavenly bodies, but merely atmospheric appearances, columns of vapour which rise from earth to the skies, to a very considerable height, far beyond the moon, and become temporarily visible to the inhabitants of the earth, in the well-known form of a comet, by the refraction of the sun's ray[illegible] As he judged comets to be without substance, and pla[illegible] them on a par with mock suns and the aurora borea[illegible]

[1] Op. xv. (Viviani), p. 350. [2] Nelli, vol. i. p. 432.

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concluded that they could have no parallax determinations.

In the same year, 1619, a Jesuit, Father Grassi, delivered a lecture on the three comets in the Roman College, in which he gave out that such phenomena were not mere appearances, but real heavenly bodies; copies of this lecture were widely circulated, and Galileo was strongly urged by his adherents to publish his opinion. He was prudent enough to evade for the time a fresh controversy, which, in the existing critical state of affairs, might bring him into danger, and apparently took no part in the scientific feud which was brewing. But he induced his learned friend and pupil, Mario Guiducci, consul of the Academy at Florence, to publish a treatise on comets. Numerous alterations and additions, however, which are found in the original MS. in the Palatina Library at Florence, attest that he had a direct share in the editorship.[1] The opinions hitherto held by philosophers and astronomers on this subject were discussed, and the author's own—that is Galileo's—expounded. Grassi's views were sharply criticised, and he was reproachfully asked why he had passed over Galileo's recent astronomical discoveries in silence.

Grassi, who recognised the real originator of the work, in the reply which he issued a few months later entirely ignored the pupil, that he might the more vigorously attack the master. Under the pseudonym of *Lothario Sarsi Sigensano*, he published a pamphlet against Galileo, entitled, "The Astronomical and Philosophical Scales."[2] It is written with

[1] Op. iv. p. 16. This appears also from a letter from Galileo of 19th June, 1619, to Cardinal Maffeo Barberini, afterwards Pope Urban VIII., accompanying the treatise. (See this letter in "Pieralisi," pp. 63, 64; and "Guitoloni et Gal. Galilei," Livorno, 1872, vol. i. p. 263.)

[2] "Libra Astronomica ac Philosophica qua Galilæi Galilæi opiniones cometis a Mario Guiduccio in Florentina Academia expositæ, atque eorum nuper editæ examinatur a Lothario Sarsi Sigensano." (Op. iv. p. 121.)

caustic bitterness, and is a model of Jesuitical malice and cunning. The comet question was for the time a secondary matter with Grassi, and he begins with a personal attack on Galileo, by disputing the priority of several of his most important discoveries and inventions, and reproaching him, with pious indignation, with obstinate adherence to a doctrine condemned by theologians. Up to this point he is only angry and spiteful, but as he goes on he becomes cunning. He sets up for a warm defender of the Peripatetic physics, and attacks the Copernican system, and its advocate Galileo, to compel him either to ignominious silence or dangerous demonstrations. Under pretext of meeting Guiducci's reproach that he (Grassi) had taken Tycho as his authority, he asks whether it would have been better to follow the system of Ptolemy, which had been convicted of error, or that of Copernicus, which every God-fearing man must abhor, and his hypothesis, which had just been condemned? In discussing the causes of the movements of comets, it seemed to him that the arguments were insinuated on which the forbidden doctrines were based. "Away!" he exclaims in righteous indignation, "with all such words so offensive to truth and to every pious ear! They were prudent enough certainly scarcely to speak of them with bated breath, and not to blazon it abroad that Galileo's opinion was founded upon this pernicious principle."

Thus attacked, Galileo prepared to defend himself. The greatest caution was necessary, for Grassi was backed by the powerful party of the Jesuits, who made a great boast of this work.[1] The letters of this period from Prince Cesi and Galileo's ecclesiastical friends at Rome show that they were very anxious that he should not make the influential order of Jesuits his enemies by a direct collision with them. But as they saw the absolute necessity of a reply, they gave him all sorts of good advice, how to parry the attack without inc[illegible]

[1] See the letter of Mgr. Ciampoli of 6th December, 1619, to G[illegible] (Op. viii. pp. 430, 431.)

ring their hatred. They were of opinion that he should not honour an adversary concealed behind a pseudonym with a reply written by himself, but should depute the task to a pupil, or, if he intended to conduct his defence in person, clothe his reply in the form of a letter instead of a treatise, not addressed to Sarsi himself, but to one of his own party.[1] He decided for the latter; and adopting a hint from Mgr. Ciampoli,[2] he addressed the reply to Mgr. Cesarini, one of his most devoted friends and dauntless defenders.

But the completion of this afterwards famous rejoinder was delayed for two years, and its publication, which, according to custom with all works by members of the Accadémia dei Lincei, was undertaken by the Society, was delayed fully another year owing to the scruples of Prince Cesi and other "lynxes." Galileo's procrastination is to be explained partly by his continued ill health, but more so by the position of affairs at Rome as well as in Tuscany, which was by no means encouraging for a contest with a Jesuit.

The imperious Paul V. was still the reigning Pope, and his good will towards Galileo would certainly only have lasted so long as he was entirely submissive. His dialectic reply, which was pervaded by cutting irony aimed at a father of the order of Jesuits, even sometimes making him appear ridiculous, could not have been much to the taste of a Pope to whom the inviolability of the Church and her ministers was all in all. It is characteristic of this pontiff that, as appears from the negotiations with James I., he seriously claimed the right of deposing kings, and called every attempt to make him relinquish this claim "a heretical proceeding," and pronounced the writings of some Venetian ecclesiastics who disputed it, to be worse than Calvinistic. Just as this stern

[1] Compare the letters of Stelluti (27th January, 1620) to Prince Cesi, [illegible] March and 18th May, 1620; and from Mgr. Ciampoli, 18th May, 1620, [illegible]alileo. (Op. viii. pp. 436–439, and 441–443.)

[illegible]ce his letter of 12th and 17th July, 1620, to Galileo. (Op. viii. p. [illegible]Volynski, "Lettere inedite," etc., p. 59.)

pontiff was gathered to his fathers (16th January, 1621), in consequence of an attack of apoplexy on the occasion of the celebration of the victory on the Weissenberg, and the good-natured and infirm old man, Gregory XV., ascended the papal chair, Galileo sustained a blow which was most disastrous to him. This was the death, on 28th February, 1621, of his kind protector and patron, Cosmo II. The protection of an energetic prince who sincerely respected him, which he had hitherto enjoyed, was replaced by the uncertain favour of a feminine government, as the widowed Grand Duchess, whose tendencies were thoroughly Romish, assumed the regency for Ferdinand II., who was still in his minority.

Under these circumstances Galileo was but little inclined to bring out his reply; and perhaps the time when they were founding the Propaganda at Rome, and enrolling Loyola and Xavier among the saints, did not seem very opportune. From the new Pope personally there was nothing to fear. The phlegmatic little man, who was so bowed down by age and sickness that those about him often feared to lay complicated business matters before him, lest he should entirely break down, was certainly not likely to inspire awe; besides, Gregory had expressed himself to Ciampoli very favourably of Galileo.[1] But the Pope's infirmities made it all the more necessary to proceed with caution; for they allowed the Romish administration to exercise full sway. And the man who guided it with almost sovereign authority was the Pope's nephew, Cardinal Lodovico Lodovisi, a former pupil and therefore zealous friend of the Jesuits.

Nevertheless Galileo's adherents, and especially his clerical friends at Rome, considered it absolutely necessary to publish his reply as soon as possible, with the precautions before mentioned, because his opponents construed his silence into a triumph for Grassi and the Aristotelian school.[2] Prince

[1] See Ciampoli's letter to Galileo, 27th May, 1623. (Op. ix. p. 30.)

[2] Compare Cesarini's letters to Galileo of 23rd June, 1621, and 7th May, 1622. (Op. ix. pp. 5 and 18.)

Cesi, Mgrs. Cesarini and Ciampoli—the latter of whom meanwhile had become Secretary of the Papal Briefs to Gregory XV., a post which he also held under his successor, Urban VIII., until he fell into disgrace about Galileo—urged him repeatedly to finish his reply.[1]

Francesco Stelluti, a member of the Accadémia dei Lincei, a learned friend of Galileo's, did indeed at this time (June, 1622) bring out a work against "Lothario Sarsi," but he only defended Guiducci, and studiously avoided touching on the reproaches cast on Galileo, in order not to anticipate him.[2]

At length, in October of the same year, Galileo sent the MS. of his celebrated work, "Il Saggiatore" (The Assayer), to Mgr. Cesarini, at Rome.[3] For five months it passed from hand to hand among the members of the Accadémia dei Lincei, who carefully criticised it, and with Galileo's consent, altered the passages which might possibly have been taken advantage of by his enemies to renew their intrigues against him. The Jesuits meanwhile had got wind of the completion of the reply, and did their utmost to get hold of one of the numerous copies of the MS.; but Cesarini, Cesi, Ciampoli, and the other "Lynxes," took good care of them, well knowing that if the Jesuits once made acquaintance with this crushing reply, they would use every endeavour to prevent its receiving the *imprimatur*.[4] This was granted on 2nd February, 1623, by the supreme authorities of the censorship, not only without hesitation, but they spoke of the work in very favourable and flattering terms. The opinion—

[1] See his letters to Galileo in 1621 and 1622. (Op. ix. pp. 11–14 and 16–18; and Wolynski, "Lettere," etc., p. 65.)

[2] "Scandaglio della Libra Astronomica e Filosofica di Lothario Sarsi nella controversia delle Comete, e particolarmente delle tre ultimamente vedute l'anno 1618, di Giovanni Battista Stelluti da Fabriano dottor di Legge."

[3] "Il Saggiatore, nel quale con bilancia esquisita e quista si ponderano le cose contenute nella Libra Astronomica e Filosofica di Lothario Sarsi Sigensano."

[4] See Cesarini's letter to Galileo, 12th January, 1623. (Op. ix. pp. 22–24.)

which was drawn up by Father Nicolo Riccardi, a former pupil of Galileo's, who will often be mentioned in the sequel, then examiner, and afterwards even Magister Sacrii Palatii—was as follows :—

"By command of the Master of the Palace I have read the work, 'Il Saggiatore,' and not only have I detected nothing in it which is contrary to good morals, or deviates from the divine truth of our religion, but I have found in it such beautiful and manifold observations on natural philosophy, that I think our age will not have to boast merely of having been the inheritor of the labours of earlier philosophers, but also of having been the discoverer of many secrets of nature which they were not able to penetrate, thanks to the subtle and solid researches of the author, whose contemporary I think myself happy to be, for now the gold of truth is no longer weighed wholesale and with the steelyard, but with the delicate scales used for gold.[1]

The commencement of the printing was again delayed till the beginning of May,[2] and then proceeded but slowly, for it was not until 27th May that Ciampoli sent the first two sheets of the "Saggiatore" to the author, in order to prove to him the falseness of a report which had meanwhile gained currency, that the printing of the work had been prohibited.[3]

An event then took place which seemed likely to produce a great change in Galileo's relations with Rome; indeed in the whole attitude of ecclesiastical authority towards the free progress of science. At all events, as we shall see, Galileo flattered himself with this hope, and not without some justification. On 8th July, 1623, Gregory XV. succumbed to age and infirmity in the second year of his pontificate. The man who at the age of fifty-five was now elevated to the papacy, not only did not in the least resemble his immediate predecessors, but his tendencies were in striking contrast to theirs. He was previously Cardinal Maffeo Barberini, and now ascended the papal throne as Urban VIII.

[1] Op. ix. p. 26.

[2] See Ciampoli to Galileo, 6th May, 1623. (Wolynski, "Lettere," etc., p. 68.)

[3] See Ciampoli's Letter to Galileo, 27th May, 1623. (Op. ix. p. 30.)

CHAPTER IX.

MAFFEO BARBERINI AS URBAN VIII.

His Character.—Taste for Letters.—Friendship for Galileo when Cardinal.—Letters to him.—Verses in his honour.—Publication of "Il Saggiatore," with Dedication to the Pope.—Character of the Work.—The Pope's approval of it.—Inconsistency with the assumed Prohibition.

SCARCELY any Pope has left to posterity so accurate a delineation of his character and aims in his own trenchant utterances as Urban VIII. When shown the marble monuments of his predecessors, he proudly observed that he "would erect iron ones to himself." And the fortress of Castelfranco on the Bolognese frontier (called, in honour of his Holiness, Fort Urbino), the new breastworks of the Castle of St. Angelo, the Vatican Library turned into an arsenal, the new manufactory of arms at Tivoli, and finally the costly harbour of Civita Vecchia, are so many silent testimonies to the cherished desire of this *pontiff* to transform the eternal city into an inviolable symbol in stone of the temporal power of the Pope, and to accredit himself as a true mediæval vicegerent of Christ with the two-edged sword of the world. His athletic physique and iron energy were ever the vigorous executors of his ideas. In his self-sufficiency he disdained to take counsel with the Sacred College, saying that he "knew better than all the cardinals put together," and boldly set himself above all ancient constitutions, alleging the unheard of reason that "the sentence of a living Pope was worth more than all the decrees of a hundred dead ones." And finally, to leave his flock, the Christian peoples, in no manner of doubt about his pastoral humility, he revoked the resolve of the Romans never again

to erect a monument to a Pope in his lifetime, saying, "such a resolution could not apply to a Pope like himself."

The desire for unlimited temporal power rises like a column out of the life of Urban VIII. Still it is not destitute of the embellishments of art, poetry, and love of learning. It is no fiction that this imperious pontiff found pleasure in turning passages of the Old and New Testaments into Horatian metre, and the song of Simeon into two sapphic strophes! His numerous and often cordial letters to Galileo bear witness also of his interest in science and its advocates; but if these scientific or poetic tastes clashed for a moment with the papal supremacy, the patron of art and science had to give place at once to the ecclesiastical ruler, who shunned no means, secret or avowed, of making every other interest subservient to his assumption of temporal and spiritual dominion.

It is simply a psychological consequence of these traits of character, that arbitrary caprice, the twin brother of despotic power, often played an intolerable part in his treatment of those who came in contact with him.[1]

This then was the character of the new head of the Catholic Church, on whom Galileo placed great hopes for the progress of science in general, and the toleration of the Copernican system in particular, though they were to result in bitter disappointment. Yet to all appearance he was justified in hailing this election, for not only was Urban VIII. a refreshing contrast to his immediate predecessors, who cared little for art or science, but as Cardinal Maffeo Barberini, he had for years shown the warmest friendship for and interest in Galileo.

Many letters from this dignitary to Galileo which have come down to us bear witness to this.[2] Thus he wrote to him from Bologna on 5th June, 1612: "I have received your treatise on various scientific questions, which have been raised during my stay here, and shall read them with great

[1] See Ranke: "Die römischen Päpste," etc., vol. ii. p. 531, etc.

[2] See Op. viii. pp. 173, 206, 208, 209, 262, 427; ix. p. 31.

pleasure, both to confirm myself in my opinion, *which agrees with yours*, and, with the rest of the world, to enjoy the fruits of your rare intellect."[1] The words, "in order to confirm," etc., have led some not very careful writers to conclude that, at all events when cardinal, Urban VIII. was a follower of Copernicus. But this is quite beside the mark. For the work in question was the one on floating bodies, with which, though the Peripatetics got the worst of it, neither Ptolemy or Copernicus had anything to do. A little more attention would have saved Philarete Chasles and others from such erroneous statements.

Another letter to Galileo from the cardinal, 20th April, 1613, after the publication of his work on the solar spots, shows the interest he took in the astronomer and his achievements. He writes:—

"Your printed letters to Welser have reached me, and are very welcome. I shall not fail to read them with pleasure, again and again, which they deserve. This is not a book which will be allowed to stand idly among the rest; it is the only one which can induce me to withdraw for a few hours from my official duties to devote myself to its perusal, and to the observation of the planets of which it treats, if the telescopes we have here are fit for it. Meanwhile I thank you very much for your remembrance of me, and beg you not to forget the high opinion which I entertain for a mind so extraordinarily gifted as yours."[2]

But the cardinal had not confined himself to these assurances of esteem and friendship in his letters, but had proved them by his actions in 1615 and 1616, by honestly assisting to adjust Galileo's personal affairs when brought before the Inquisition. And Maffeo Barberini attributed the success then achieved in no small degree to his own influence, and used even to relate with satisfaction when Pope, that he had at that time assisted Galileo out of his difficulties. But here we must remind those authors who represent Barberini, when cardinal, as a Copernican, in order to paint his subsequent attitude as Pope in darker hues than history warrants, that

[1] Op. viii. p. 206.

[2] Op. viii. p. 262.

although in 1615 and 1616 he exerted himself for Galileo personally, he in no way sought to avert the condemnation of the system.

In 1620, however, Barberini gave Galileo a really enthusiastic proof of his esteem. He celebrated his discoveries in some elegant and spirited verses, in which astronomy was allied with morality, and he sent them to Galileo, under date of 28th August, with the following letter:—

"The esteem which I always entertain for yourself and your great merits has given occasion to the enclosed verses. If not worthy of you, they will serve at any rate as a proof of my affection, while I purpose to add lustre to my poetry by your renowned name. Without wasting words, then, in further apologies, which I leave to the confidence which I place in you, I beg you to receive with favour this insignificant proof of my great affection."[1]

When this dignitary, who was generally regarded as a friend and protector of science, had ascended the papal chair, the "Accadémia dei Lincei" hastened to dedicate "Il Saggiatore" to his Holiness, in order to spoil the sport of the author's enemies beforehand.

To the annoyance of Galileo's opponents and delight of his friends, by the end of October, 1623, "Il Saggiatore" appeared. This work is a masterpiece of ingenuity; for the author not only dexterously avoids falling into the snares laid for him by Father Grassi, but prepares signal defeats for him. Galileo takes his attack on him, "The Astronomical and Philosophical Scales," paragraph by paragraph, throws light on each, and disputes or confutes it. And it is done in so sparkling and spirited a style, and the reasoning, pervaded by cutting sarcasm, is so conclusive, that "Il Saggiatore" certainly deserves to be called a model of dialectic skill.

[1] Op. viii. p. 451. Pieralisi in his work, "Urban VIII. and Galileo Galilei," Rome, 1875, pp. 22, 27, gives Barberini's ode, which is in Latin, and consists of nineteen strophes, as well as a commentary on it, which has not been printed by Campanella. See also pp. 65, 66, Galileo's reply to Barberini, in which he expresses his warm thanks and his admiration of the poetry. This is not in Albèri's work.

Our limits preclude going further into its scientific contents. For our purpose it will suffice to say that Galileo took occasion in it to lash many errors in Grassi's work unmercifully, and thereby incurred the eternal hatred of the all powerful Jesuit party. Thus it was to a great extent the purely scientific "Saggiatore" which subsequently conjured up the tragic element in Galileo's fate.

Another interesting point in the work is the way in which Galileo replies to Grassi's interpellations about the system of the universe. Admirable as is the ingenuity with which he performs this ticklish task, one cannot sympathise with the denial of his inmost convictions. He parries the provocations of his adversary by demonstrating that the Ptolemaic and Copernican doctrines had nothing to do with the controversy about comets, and that this question was only raised by "Sarsi" in order to attack him (Galileo). He adds the ambiguous remark: "As to the Copernican hypothesis, I am fully convinced that if we Catholics had not to thank the highest wisdom for having corrected our mistake and enlightened our blindness, we should never have been indebted for such a benefit to the arguments and experiences of Tycho."[1] He then shows that the Copernican system, "which, as a pious Catholic, he considers entirely erroneous and completely denies," perfectly agrees with the telescopic discoveries, which cannot be made to agree at all with the other systems. But since, in spite of all this caution, a defence of the new system might have been detected in these statements, Galileo hastens to the conciliatory conclusion, that since the Copernican theory is condemned by the Church, the Ptolemaic no longer tenable in the face of scientific research, while that of Tycho is inadequate, some other must be sought for.

Notwithstanding all this fencing, however, no one can fail to see in "Il Saggiatore" an underhand defence of the Copernican system, as is evident from the passages quoted. Such

[1] Op. iv., "Saggiatore," p. 172.

a vague discussion of it as this, however, did not compromise Galileo according to the decree of 5th March, 1616; but "Il Saggiatore" would have directly contravened the assumed absolute injunction to silence on that system of 26th February, and Galileo would certainly not have ventured to write in this style if the Commissary-General of the Holy Office had, in 1616, solemnly forbidden him to discuss the said doctrine in any way whatever (*quovis modo*). This is another proof that this famous prohibition was not issued to Galileo in the form in which it occurs in the archives of 26th February.

"Il Saggiatore" was, indeed, denounced to the Inquisition in 1625, by Galileo's opponents, as containing a concealed endorsement of the Copernican system, and a motion was made in the Congregation of the Holy Office to prohibit it, or at any rate to have it corrected; but it was not carried, and the party only prepared a defeat for themselves. In consequence of the denunciation, a cardinal was charged to investigate the matter, and to report upon it. He selected Father Guevara, General of the Theatines, to assist him, who, after careful examination of the work in question, spoke in high praise of it, recommended it most warmly to the cardinal, and even gave him a written statement, in which he explained that the opinion of the earth's motion, even if it had been maintained, would not have appeared to him a reason for condemning it.[1] Even Urban VIII., who, we must suppose, was perfectly acquainted with the proceedings of 1616, does not appear to have had any scruples about "Il Saggiatore," for he had it read aloud to him at table, immediately after its publication,[2] and, as Galileo was assured, enjoyed it highly.[3]

[1] See for these transactions the letter of Mario Guiducci, from Rome, to Galileo, of 18th April, 1625. (Op. ix. pp. 78–80.)

[2] Cesarini's letter to Galileo, 28th October, 1623. (Op. ix. pp. 43, 44.)

[3] Rinuccini's letters to Galileo, 3rd November and 2nd December, 1623. (Op. Suppl. p. 154; and ix. p. 50.)

CHAPTER X.

PAPAL FAVOUR.

Galileo goes to Rome to congratulate Urban VIII. on his Accession.—Favourable Reception.—Scientific discussions with the Pope.—Urban refuses to Revoke the Decree of 5th March.—Nicolo Riccardi.—The Microscope.—Galileo not the Inventor.—Urban's favours to Galileo on leaving Rome.—Galileo's reply to Ingoli.—Sanguine hopes.—Grassi's hypocrisy.—Spinola's harangue against the Copernican System.—Lothario Sarsi's reply to "Il Saggiatore."—Galileo writes his "Dialogues."

ON the accession of Urban VIII. Galileo formed a project of offering his congratulations to the new Pope at Rome, and of using all his personal influence on the occasion to obtain toleration for the Copernican system, now no longer opposed by the weighty influence of Cardinal Bellarmine, for he had died two years before. But he first consulted his friends at Rome, whether he would be well received, and especially by his Holiness. He wrote among other things to Prince Cesi, on 9th October, 1623: "I have in my head plans of no small importance for the learned world, and perhaps can never hope for so wonderful a combination of circumstances to ensure their success, at least so far as I am able to conduce to it."[1] Cesi, who well understood Galileo's mode of speaking, confirmed him in his intentions in his answer of 21st October, and urged him to carry out his project speedily. "It is necessary for you to come, and you will be very welcome to his Holiness," wrote the Prince.[2] Thomas Rinuccini, brother of the Archbishop of Fermo, of whom Galileo made the same inquiries, replied as commissioned by the new Pope's nephew, Cardinal Francesco

[1] Op. vi. pp. 289, 290.

[2] Op. ix. pp. 42, 43.

Barberini, that Urban VIII. would always be pleased to receive him, and told him that he had had a long audience of the Pope himself three days ago, of which he reported to Galileo :—

"I swear to you that nothing pleased his Holiness so much as the mention of your name. After I had been speaking of you for some time, I told him that you, esteemed sir, had an ardent desire to come and kiss his toe, if his Holiness would permit it, to which the Pope replied that it would give him great pleasure, if it were not inconvenient to you, and if the journey would not be injurious to your health ; for great men like you must spare themselves, that they may live as long as possible." [1]

Galileo now resolved to go to Rome as soon as he could, but his uncertain health and the unprecedentedly bad weather, which had laid whole tracts of land under water, delayed his departure. His friends at Rome wrote meanwhile again and again, encouraging him to set out, for the Pope, Cardinal Barberini, and all his exalted patrons and numerous adherents were longing for his presence ;[2] and Mgr. Ciampoli assured him that he "would find that his Holiness had a special personal affection for him."[3]

At length, on the 1st April, Galileo was able to set out, although the state of his health was still such that he could only perform the journey in a litter. He reached Aquasparta on 8th April, spent a fortnight with Prince Cesi in his fine place there, and discussed the affairs which lay so near his heart with his learned and influential friend. He did not arrive in Rome till towards the end of April. The long-expected guest would have been sure of a distinguished reception, even without the Grand Duchess Christine's letter[4] of recommendation to her son, Cardinal de' Medici. Every one was aware of the favour which the new Pope entertained

[1] Letter of 20th October. (Op. ix. pp. 40, 41.)

[2] See Rinuccini's letter to Galileo of 2nd December, 1623 ; and Guiducci's of 18th December. (Op. ix. pp. 48–53.)

[3] Compare Ciampoli's letter to Galileo of 16th March, 1624. (Op. ix. p. 55.)

[4] Op. ix. p. 56.

for the great astronomer. His old adherents, therefore, received him with greater delight than ever; and his enemies, for the time, only ventured to clench their fists behind his back. His letters of this period express the great satisfaction which this flattering reception afforded him.[1] The prospect did not indeed look quite so favourable for his cause. Within six weeks he had had six long audiences of Urban VIII., had been most affably received by him, and had found opportunity to lay before him all his arguments in defence of the Copernican system;[2] but he would not be convinced, and in one of these discussions tried to turn the tables, and to convince the advocate of the modern system of its incorrectness, in which he met with no success. And not only did Urban, in spite of his esteem for Galileo, turn a deaf ear to his arguments, but he would not grant his petition for toleration of the new doctrine; on this point he was quite inexorable.

In vain did Galileo obtain the support of several of the cardinals who were friendly to him, to gain permission from the supreme ruler of Christendom to teach the Copernican system *as true*. The Pope said to Cardinal Hohenzollern, who, at Galileo's request, warmly took up the question, and had observed in a conversation on it with Urban, that great caution was required in dealing with it, "that the Church neither had condemned nor ever would condemn the doctrine as heretical, but only as rash."[3] This language was, as Henri Martin justly observes,[4] more than wanting in precision; for in the first place the Church had never condemned it at all, either as "heretical" or "rash," for the Qualifiers of the Holy Office never mean the "Church"; and in the second place, this commission had, in 1616, not condemned this

[1] Compare his letter from Rome of 8th June to Cesi, who was then at Aquasparta. (Op. vi. pp. 295–297.)

[2] Ibid.

[3] . . . "Fu da S. Santita risposto come S. Chiesa non l' avea dannata, ne era per dannarla per eretica, ma solo per temeraria." Comp. Galileo's letter to Cesi, 8th June. (Op. vi. pp. 295–297.)

[4] Page 92.

opinion as "rash," but "foolish and absurd philosophically, and formally heretical," and this without the papal confirmation, so that no condemnation by the Church could be said to exist.

Galileo, finding that Urban, with all his friendly feeling towards him personally, would never be persuaded to revoke the decree of 5th March, 1616, resolved to return home after a stay of six weeks at Rome. There was little to be gained by remaining longer. As soon as the attitude which Urban intended to assume towards the prohibited doctrine became evident, Galileo's clerical adherents as far as possible avoided expressing themselves on the subject, and the moderate party among the Romanists merely advised him to take care that his scientific speculations did not contradict Holy Scripture.

Father Nicolo Riccardi, who was much attached to Galileo and took a great interest in his subsequent trial, was very ingenious in maintaining a safe neutrality between the two systems. This good man, to whom from his eloquence, or as others said because he was so fat, the King of Spain had given the nickname of "Il Padre Mostro," prudently agreed neither with the Ptolemaic nor the Copernican system, but contented himself with a view as peculiar as it was convenient. He saw no difficulty in the stars being moved, as we see them to be moved in the vault of heaven, by angels, a proceeding which demanded nothing on our part but wonder and admiration.[1]

Meanwhile Galileo's stay at Rome had been of essential service to science, although in quite a different way from that which he intended on his arrival. In 1622 a certain Jacob Kuppler, from Cologne, came to Rome with a microscope made by a relative of his, a Dutchman of the name of Drebbel, in order to lay the new discovery, of which Drebbel claimed to be the inventor,[2] before the papal government.

[1] Comp. Galileo's letter to Cesi, 8th June, before mentioned.

[2] History has assigned the merit of this valuable discovery to Zacharias Jansen, a spectacle maker of Middelburg, from whose workshop the first microscope went forth near the end of the 16th century, probably in 1590

Kuppler, however, died before he had an opportunity of exhibiting his instrument to the court. Soon afterwards many other microscopes were sent to Rome, where, however, no one knew how to use the complicated instrument. Galileo not only at once perceived its use, but greatly improved it.[1] He afterwards sent many of these improved instruments to his friends, and before long his microscopes were in as great request as his telescopes.[2] In order to rectify a mistake that has been often repeated, that Galileo was the inventor of this instrument of such vast importance to science, we mention here that he never claimed this merit himself; it was his eulogist, Viviani, who first claimed it for him, and his thoughtless followers have repeated it. Galileo had indeed, as he mentions in his "Il Saggiatore," discovered a method of using the telescope to magnify objects as early as 1610, but it required an over-zealous biographer to claim Galileo as the inventor of the microscope from this. It was, however, he who, in 1624, brought the microscope to a degree of perfection on which for a long time no advance was made.

Urban VIII. heaped favours of all sorts on Galileo before his departure. He promised him a pension for his son,[3] three days afterwards he sent him a splendid picture, then again two medals—one of silver, the other of gold, and quite a

[1] Rezzi, pp. 8–10 and 36–40.

[2] Op. vi. p. 297; ix. p. 64.

[3] Galileo was never married, but he had a son who was legitimised in 1619 by Cosmo II., and two daughters, by Marina Gamba, of Venice. His daughters took the veil in the Convent of S. Matteo, at Arcetri. The mother of his children afterwards married a certain Bartolucci, with whom Galileo subsequently entered into friendly correspondence, which was quite in accordance with the state of morals and manners in Italy at that period. The pension of sixty dollars was granted in 1627, but owing to the religious exercises attached as a condition, Galileo's son did not accept it. It was then transferred to a nephew, but, as he proved unworthy of it, to Galileo himself, with an increase of forty dollars, but with the condition, as it was derived from two ecclesiastical benefices, that he should adopt the tonsure, to which he consented. He drew the pension which thus irregularly accrued to him as long as he lived.

number of Agnus Dei[1]; poor consolation, it is true, for the disappointment of the great expectations with which he came to Rome. However, he did not return to Florence entirely without hope. Although there could be no longer any expectation of a public revocation of the famous decree, he was fain to believe that it would not be rigidly kept to, and thought that, supported by his papal patron, he should be able ingeniously to circumvent it. He was far from thinking that the fetters placed by the ecclesiastical power on the free course of the Copernican doctrine were removed, but he was of opinion that they were considerably loosened. And ensuing events, as well as all the news which Galileo received from his friends at Rome, were calculated to confirm the idea. The Pope, wishing to give a strong official proof of his favour, had himself addressed a letter to the Grand Duke of Tuscany, in which, to the no small chagrin of Galileo's enemies, he had not only done full justice to his services to science, but had laid special stress on his religious sentiments. In this letter of 7th June, 1624, Urban first mentioned Galileo's great discoveries, "the fame of which will shine on earth so long as Jupiter and his satellites shine in heaven." And after declaring that he felt a true fatherly affection for so great a man, his Holiness continued :—

"We have observed in him not only the literary distinction, but also the love of religion and all the good qualities worthy of the papal favour. When he came to congratulate us on our accession, we embraced him affectionately, and listened with pleasure to his learned demonstrations which add fresh renown to Florentine eloquence. We desire that he should not return to his native country without having received by our generosity manifold proofs of our papal favour. . . . And that you may fully understand to what extent he is dear to us, we wish to give this brilliant testimony to his virtues and piety. We are anxious to assure you that we shall thank you for all the kindness that you can show him, by imitating or even surpassing our fatherly generosity."[2]

With his hopes raised still higher by these unusually gracious

[1] Op. vi. p. 295.
[2] Op. ix. pp. 60, 61 ; Pieralisi, pp. 75, 76.

words of his papal patron, Galileo ventured, soon after his return from Rome, to reply to a refutation of the Copernican system, which in 1616 had been addressed to him as its most distinguished advocate in the then favourite form of a public letter, by a certain Ingoli, then a lawyer at Ravenna, and afterwards secretary of the Propaganda at Rome. Ingoli, though an adherent of the old system, was at the same time a sincere admirer of Galileo, so that his arguments against the theory of the double motion of the earth were characterised by great objectivity. After the events of 1616, Galileo had wisely refrained from answering it; in 1618, however, it had been done by another corypheus of science, Kepler, in his "Extracts from the Astronomy of Copernicus,"[1] in which he valiantly combated Ingoli's objections. But the latter did not consider himself beaten, and replied in a letter addressed to a chamberlain of Paul V.

Now, after the lapse of eight years, Galileo thought that, protected by the favour of Urban VIII., he might venture on a reply to Ingoli. But he again took care in writing it not to come into collision with the decree of 5th March. With the assumed imperious prohibition of February, 1616, this step of Galileo's can be no more made to agree than his sending his treatise on the tides to the Archduke Leopold of Austria, 1618, or the publication of "Il Saggiatore." Galileo undertakes, in the reply to Ingoli, to defend the Copernican doctrine under a double pretext. On the one hand, he says he wishes to show that, as he had given currency to the new system of the universe before it was condemned by ecclesiastical authority, he had not been the defender of an improbable or unreasonable idea; on the other hand, he wishes to prove to the Protestant Copernicans in Germany, that in Catholic Italy the views of their great countryman had not been rejected from ignorance of their great probability, "but from reverence for Holy Scripture, as well as zeal for religion and

[1] This work was placed upon the Index of prohibited books by a decree of 10th March, 1619.

our holy faith." After this ingenious introduction, and an assurance that he had no intention whatever of representing the forbidden doctrine *as true*, he proceeds with equal politeness and vigour to refute all Ingoli's objections.[1]

In spite of this diplomatic introduction, however, his friends at Rome, well aware of the malice of his enemies, and having had but a few months before to defend "Il Saggiatore," urgently dissuaded him from having this rather warm defence of a forbidden doctrine printed.[2] He gave heed to their warnings, and so this reply was only circulated in numerous copies among the learned world in Italy.

Meanwhile the reports which Galileo was constantly receiving from his friends at Rome tended to increase his confidence in the favourable influence which Urban's personal liking for him, and his taste for art and science, were likely to exercise on tolerance of the Copernican system. Thus his devoted adherent Guiducci, in several letters of 6th, 13th and 24th September, 1624,[3] told him, that through the mediation of the Jesuit father, Tarquinio Galuzzi, he had had several interviews with Galileo's former bitter adversary, Father Grassi, who had said that Galileo's theory that the phenomena of the tides were to be attributed to the double motion of the earth "was very ingenious," and that when the truth of these opinions was unanswerably established, the theologians would bestir themselves to alter the interpretation of those passages of Scripture which refer to the earth as being stationary! The guileless Guiducci added confidentially, quite taken with this Jesuit's amiability, that he had not noticed any great aversion to the new system in Grassi, indeed he did not despair of estranging "Lothario Sarsi" from Ptolemy.

Two months later, however, the same correspondent told Galileo that a violent harangue had been delivered in the

[1] Op. ii. pp. 64–115.

[2] See Guiducci's letter to Galileo from Rome, 18th April, 1625. (Op. ix. pp. 78–80.)

[3] Op. ix. pp. 65–71; Suppl. pp. 162–164.

Jesuit College at Rome against the adherents of the new doctrine, by Father Spinola, and some time afterwards he sent him a copy of it;[1] but as it attacked all those who did not profess to be followers of an antiquated Peripateticism, it made but little impression on Galileo, and that little was entirely effaced when Mgr. Ciampoli wrote to him, on 28th December, 1625, that he had acquainted the Pope with several passages of his reply to Ingoli, and that he had highly approved them.[2]

Before long Guiducci found out how bitterly he had been deceived in Grassi, and what a miserable game he had been playing with him as Galileo's friend. The memory of the favours by which the Pope had distinguished the great Tuscan when at Rome had scarcely died away when Grassi threw aside the mask, and "Lotharió Sarsi" exhibited himself in a new and revised edition, fulminating rage and venom against Galileo and his system. Notwithstanding the hypocritical moderation exhibited to Guiducci, he had not forgotten the mortifying defeat which "Il Saggiatore" had subjected him to, and, though circumstances had prevented him from defending himself at once, he had by no means given up the intention of doing so. Two years having elapsed since Galileo's visit to Rome, Grassi thought he might venture, under pretext of a reply to "Il Saggiatore," to publish a new attack on its author. It was entitled, in bad Latin: "Ratio ponderum Libræ et Simbellæ, etc. Autore Lothario Sarsi Sigensano." It contained many personal accusations against Galileo, and the work altogether was characterized by a blind hatred, which repeatedly led the author into very foolish statements. For instance, Grassi tried incidentally to prove by very ingenious arguments that Galileo's physics would lead to the denial of the real presence in the Lord's Supper![3] But the

[1] See Guiducci's letters to Galileo of 8th, 15th, and 22nd November, 21st and 27th December, 1624; and 4th January, 1625. (Op. Suppl. pp. 168–178.)

[2] Op. ix. p. 97.

[3] Op. iv. pp. 486, 487.

enraged Jesuit went still further, and gave his readers pretty plainly to understand that since Galileo agreed on many questions of physics with Epicurus, Telesius, and Cardanus, he must also approve their godlessness, which strange assertion, however, he did not venture to sustain by any evidence.

To Galileo it seemed an encouraging sign of the times that it was considered desirable to seek a publisher for these accusations from a member of the Roman College away from the papal residence. Grassi's effusions came out at Paris in 1626, and at Naples in 1627. The very unfavourable reception of the work at Rome, except among a few pettifogging enemies of Galileo, also tended to confirm him in his unfortunately mistaken opinion that Rome, under the pontificate of Urban VIII., would have little or nothing to object to in the rich harvest promised by the researches of Copernicus and Kepler, as well as by his own discoveries in the field of science. He thought he could reckon on papal tolerance, if only the defence of the new system were so circumspectly handled as not to clash with the oft-mentioned decree of the Congregation.

On this assumption he had resolved, immediately after his return from Rome, to carry out the great work which he had long projected, and which, from the vast scientific knowledge it displayed, combined with a brilliant style, was to meet with greater success and favour than had ever been attained by any scientific work. This was his "Dialogues on the Two Principal Systems of the World."

PART II.

PUBLICATION OF THE "DIALOGUES ON THE TWO PRINCIPAL SYSTEMS OF THE WORLD," AND TRIAL AND CONDEMNATION OF GALILEO.

CHAPTER I.

THE "DIALOGUES" ON THE TWO SYSTEMS.

Origin of the "Dialogues."—Their Popular Style.—Significance of the name Simplicius.—Hypothetical treatment of the Copernican System.—Attitude of Rome towards Science.—Thomas Campanella.—Urban VIII.'s Duplicity.—Galileo takes his MS. to Rome.—Riccardi's Corrections.—He gives the *Imprimatur* on certain Conditions.—Galileo returns to Florence to complete the Work.

It is a curious fact that the very work which was destined to be one of the most powerful levers in obtaining general recognition for the true order of the universe originated in what we now know to be an erroneous idea. The famous book, "Dialogues on the Two Principal Systems of the World, the Ptolemaic and Copernican,"[1] arose out of the treatise on the tides which Galileo wrote at Rome, in 1616, at the suggestion of Cardinal Orsini.[2] The important influence of these "Dialogues," both on science and the subsequent fate of the author, obliges us to discuss them more particularly.

The book contains a great deal more than is promised by the title; for the author included in it, in connection with the discussion of the two systems, nearly all the results of his researches and discoveries in science, extending over nearly fifty years. He also endeavoured to write in a style which

[1] "Dialogo di Galileo: dove nei congressi di quattro giornate si discorre sopra i due Massimi Sistemi del Mondo Tolemaico e Copernicano, proponendo indeterminatamente le ragioni filosofiche e naturali tanto per l' una parte, che par l' altra."

[2] Comp. Galileo's letters of 7th Dec., 1624, and 12th Jan., 1630, to Cesare Marsili (Op. vi. pp. 300 and 355); also Cesi's letter to Galileo, 12th Oct., 1624 (Op. ix. p. 71).

should be adapted not for the learned world alone, but which would be both intelligible and attractive to every educated person; and in this he attained complete success, for he wished by means of this book to extend as widely as possible a knowledge of the true order of nature. The form of the work was most happily chosen. The results of the researches of a lifetime were not given to the reader in a work redolent of the pedantry of the professor's chair, in which scientific demonstrations drag on with wearisome monotony, but in the lively form of dialogue, which admitted of digressions and gave the author scope for displaying his seductive eloquence, his rare skill in dialectics and biting sarcasm—in short, for his peculiarly brilliant style.

The dialogue is carried on by three interlocutors, two of whom adduce the scientific reasons for the double motion of the earth, while the third honestly tries to defend the opinions of the Aristotelian school with all the scientific means at his disposal, and as these did not suffice, with the arts of sophistry also. If he has but little success, the fault lies with the cause he advocates. Galileo gave to the defenders of the Copernican system the names of his two famous pupils and friends, neither of them then living, Filipo Salviati, of Florence, and Giovan Franceso Sagredo, senator of Venice, thereby erecting a better monument to them than he could have done in marble. Salviati is the special advocate of the Copernican theory. Sagredo takes the part of an educated layman, intelligent, impartial, and desirous to learn. The advocate of the Ptolemaic system was called briefly Simplicius, a pseudonym over which the learned have often puzzled their heads. Did he give this name of simpleton satirically to the champion of the ancient system, or was it merely an allusion to Simplicius, the commentator of Aristotle, as Galileo stated in his "Avviso al lettore?"

The selection of this name is characteristic of the ambiguous attitude which the author maintains in his "Dialogues." The sarcastic vein is obvious throughout, but is ingeniously con-

cealed behind a mask intended to inspire confidence. Salviati conducts the arguments for the Copernican theory with such convincing force and clearness, and annihilates so completely all the objections of the unfortunate Simplicius, that no unbiassed reader can fail to perceive the scientific superiority of the modern theory to the old. And as Galileo conscientiously puts in the mouth of the Peripatetic philosopher every possible argument in favour of the Aristotelian cause, as well as the objections to the other side, the total defeat of its advocate is a victory all the more brilliant for the immortal Canon of Frauenburg.

The condition that the Copernican doctrine is only to be employed as a hypothesis is ostensibly fully complied with. If Salviati or Sagredo demonstrate to Simplicius the untenableness of some Ptolemaic axiom, or add an important stone to the Copernican structure, Galileo hastens to interpolate some remark to weaken the impression. It must be confessed, however, that the agreement of this "hypothesis" with all the phenomena of nature is as clear as daylight; and when, for instance, it is said that the final decision in the present controversy rests neither with mathematics and physics, nor with philosophy and logic, but solely with a "higher insight," or when Salviati repeatedly asserts that he does not in the least wish to maintain the truth of the Copernican doctrine, but applies the word "possibly" to it, or speaks of it as a "fantasia" or "vanissima chimera," the reader cannot fail to perceive that these prudent reservations, which always occur at critical passages, are made with the sole purpose of rendering the publication of the work possible.

The preface and conclusion have no logical agreement with the contents of the "Dialogues," and owe their origin to the same motive. In the preface the ecclesiastical prohibition of 1616 to teach that the earth moves, is actually called a "salutary edict" (*un salutifero editto*)! The reader learns further, to his no small astonishment, that the purpose of this comprehensive work is to refute the wholly unfounded opinion

which has gained much credit abroad, that this adverse judgment of Rome was not the result of mature deliberation, but merely of the hasty impulse of judges who were not qualified to decide on these questions of natural science. Galileo asserts that his zeal did not permit him to keep silence in face of those audacious accusations, and that being in possession of all the circumstances connected with that prudent decision, he felt constrained to bear witness to the truth before all the world. In bringing forward here all his speculations on the Copernican doctrine, he wished to show that at Rome, where he had taken part in the consultations, they had been fully aware of all the arguments which could be adduced in favour of the new doctrine.[1]

On the origin of this singular introduction, a point on which divergent and often unwarranted opinions prevail, we shall enter in detail in its right place.

The conclusion of the work, which is divided into four "days," agrees no better with the rest of the contents than the preface. Although the Copernicans everywhere gain the day, Galileo takes care, for very good reasons, not to draw any conclusions from it on the fourth day. The discussion ends apparently without coming to any result. Salviati disclaims any wish to force an opinion on any one which seemed to him a "chimera" or a "paradox." Addressing himself to Sagredo, he remarks that Sagredo had often agreed with the opinions he had expressed, but he thinks that this was often more from their originality than their conclusiveness. Having therefore thanked him for his "polite indulgence," he apologises to Simplicius for the eagerness of his language, and assures him that he had no intention of offending him, but rather of inducing him to communicate his sublime ideas (!), which would certainly be instructive to himself. In conclusion, they agree to meet again for a final discussion.[2]

Did Galileo really intend to add a fifth day? Martin

[1] Op. i. ("Dialogo di Galileo Galilei," etc.), pp. 11, 12.
[2] Op. i. pp. 501–503.

thinks it probable, "for," he says, "Galileo might at that period still have hoped that the ecclesiastical authorities would tolerate the new system during his lifetime, especially should some new discovery, as, for instance that of a small annual parallax of the fixed stars, afford certain proof in favour of his system. In that case Galileo would have been at last allowed to express his opinions without reserve."[1] We think it very possible, indeed probable, that Galileo did intend to add a fifth day at a favourable opportunity, in which he would have given the result of the previous discussions; but he certainly was not waiting for "some new discovery." It was his firm conviction that none was wanted, since his telescopic observations amply proved the truth of his theory; neither would the most convincing discovery have enabled him to express his views without reserve, for they had by no means been condemned by the clergy from want of proof, but as "foolish and absurd philosophically and formally heretical."

We are quite aware that certain writers who have assumed the task of defending the action of the curia against Galileo, maintain that the ecclesiastical party objected to the new system because its accordance with the phenomena of nature had not been sufficiently proved.[2] But even were this granted, in view of the opposition raised on scientific grounds and the rooted attachment to old opinions, every unbiassed person must demur to the assumption that in the attitude of Rome towards the Copernican question the interests of science had any influence whatever. It could not be an advantage to science to trammel free discussion. The subsequent harsh proceedings against Galileo, when seventy years of age, the hostile and peremptory attitude which Rome maintained towards him until his death, as well as towards

[1] Martin, p. 99.

[2] Comp. for example the essay: "Der Heilige Stuhl gegen Galileo Galilei u. das astronomische System des Copernicus"; also Marini, pp. 70–73.

the new system and all discussion of it, bear ample testimony, in our opinion, that the clergy had the interests of science very little at heart, and that their sole desire was to maintain the foundation-stone in its place on which the ingenious structure of the Christian Catholic philosophy was raised; namely, the doctrine that mother earth is the centre of the universe.

In December, 1629, Galileo had completed his ill-fated work on the two systems, except the introduction and a few finishing strokes. He announced this to his friends in sundry letters,[1] and told Prince Cesi in two letters of 24th December, 1629, and 13th January, 1630, that he intended coming to Rome to see to the printing of the "Dialogues."[2] The prince in his reply expressed entire approval of the project, and encouraged Galileo to set out for Rome very soon, "where he would have no further trouble about the proofs than to give such orders as he pleased."[3]

Altogether the position of affairs seemed remarkably favourable for the publication of the "Dialogues." Galileo's devoted adherent, Castelli, had been summoned to Rome in 1624 by Urban VIII., and enjoyed great consideration with the powerful family of Barberini, to whose youngest scion, Taddeo, he gave instruction in mathematics. This long-tried friend informed Galileo in a letter of 6th February,[4] that Father Riccardi, who meanwhile had been raised to the office of chief censor of the press (Magister Sacri Palatii) had promised his ready assistance in Galileo's affairs. Castelli also expressed his conviction that, as far as Riccardi was concerned, he would find no difficulty. Another piece of information in the same letter, however, was not quite so satisfactory; the personage second in importance at the papal court, Urban's brother, Cardinal Antonio Barberini, had, when Castelli told him of the completion of the "Dialogues," said nothing particular against the theory itself, so

[1] Op. vi. pp. 333–336.
[2] Ibid. pp. 333 and 336.
[3] Op. ix. p. 167.
[4] Ibid. pp. 173–175.

far as it was treated as a hypothesis, but had made the just remark that the earth, if it revolved round the sun, must be a star, an idea "which was too far opposed to theological truth." Castelli appeased the cardinal by assuring him that Galileo had weighty arguments against this, and it is characteristic of the prevailing confusion of ideas on astronomical subjects, that Barberini thought this possible, and that Castelli wrote to Galileo that he would not find it hard to steer clear of this rock. Another instance of the trammels placed by religion on the advancement of science.

A second letter of Castelli's to Galileo of 16th March, 1630, contains far more important and encouraging intelligence. According to this, Thomas Campanella[1] had told the Pope at an audience, that a short time before he had tried to convert some German nobles to the Catholic faith, that he had found them favourably disposed, but when they heard of the prohibition of the Copernican system, they were so indignant that he could do nothing more with them. To this Urban

[1] This celebrated Dominican monk, who in 1599 had been condemned by Spanish despotism to imprisonment for life, ostensibly for having taken part in the insurrection in Calabria, but in fact for his liberal opinions, had been released by Urban VIII. in 1626, under pretext of a charge of heresy. After having been detained for three years for appearance's sake, in the palace of the Holy Office, he had, after 1629, been at large in Rome. Campanella was one of Galileo's most zealous adherents, and, so far as his imprisonment permitted, he had corresponded with him for years. A letter of his to Galileo of 8th March, 1614, is noteworthy (Op. viii. pp. 305–307), in which he entreats him to leave all other researches alone and to devote himself solely to the decisive question of the system of the universe. In conclusion he makes the singular offer to cure Galileo, who was then lying ill, by means of "the astrological medicine"! In 1616, when the Copernican theory had been denounced by the Inquisition as heretical, the Inquisitor Cardinal Gaetani applied to Campanella, who was widely known for his learning, to give his opinion on the relation of the system to Holy Scripture. In compliance with this demand, Campanella wrote a brilliant apology for Galileo, in which the expert theologian and mathematician brought the system into agreement with the Bible. But even the zealous demonstrations of the imprisoned philosopher did not avail to avert the decree of the Sacred Congregation.

replied: "It never was our intention; and if it had depended upon us, that decree would not have been passed."[1] These pregnant words, coolly uttered by Urban, when repeated to Galileo were well calculated to mislead him into infringing the decree, in the spirit if not in the letter. They seem, however, to have been at least as incorrect as the reply reported on the same subject to Cardinal Hohenzollern in 1624. Urban entirely forgot that he had not interceded in any way in 1616 for the astronomical system threatened with condemnation. And his conduct showed that he must have been a party to it. We need only call to mind how inexorable he had been on the question in 1624 to Galileo himself, and how sternly he afterwards allowed proceedings to be taken against him. Urban could only have acted in this way because he was convinced of the danger of the Copernican system to the Christian philosophy. And he was far too shrewd not to perceive how the modern views threatened a religion based upon ancient astronomy. His remark to Campanella, therefore, was nothing but smooth words, and this is fully confirmed by subsequent events. But they could not fail to inspire Galileo with confidence that under Urban VIII. an ingenious circumvention of the decree would give no offence at the Vatican. Besides this, Castelli reported in the same letter that Mgr. Ciampoli, who was also well informed, was firmly convinced that Galileo's personal appearance at Rome would immediately remove any difficulty that might occur about publishing the "Dialogues."[2] Another letter from Castelli of 6th April urged him to set out for the papal residence, where, to quote the words of Ciampoli, "they were longing for him more than for a lady love."[3]

[1] "Non fu mai nostra intenzione, e se fosse toccato a noi non si sarrebe fatto quel decreto." (Op. ix. p. 176.)

[2] Op. ix. pp. 176, 177.

[3] "Che lei è desiderata piu che qualsivoglia amatissima donzella." (Op. ix. p. 178.)

Full of hope from these promising reports, on 3rd May Galileo arrived at Rome with the MS. of his "Dialogues." And events during his two months' stay seemed to realise his expectations. Soon after his arrival he had a long audience of Urban VIII., and wrote on 18th May in high spirits to Florence:—"His Holiness has begun to treat my affairs in a way that permits me to hope for a favourable result."[1] Riccardi also met Galileo, as was to be expected from Castelli's letters, in the most obliging way. Galileo showed him his work with the express request that he would examine it closely. The papal censor, however, could not but perceive, with all his personal regard for Galileo, that in his "Dialogues" he had by no means always kept, *de facto*, within the limits of hypothetical treatment of the Copernican system, and in some parts had far exceeded them. He decided, therefore, both as his official duty and in the interest of Galileo himself, to have the book altered to the hypothetical standpoint. Many corrections were to be made, and both preface and conclusion were to be altered so as to agree with them. Riccardi intrusted the first task to his official assistant, Father Rafael Visconti, who seemed well qualified for it in his capacity of professor of mathematics. He executed it with equal prudence and ingenuity, improved many passages, and finally approved the work thus revised.

The middle of June had meanwhile arrived, and Galileo was anxious to leave Rome on account of the heat. But Riccardi wished to look through the "Dialogues" once more after they had been revised by Visconti, before giving them his *imprimatur*. Galileo represented that this second revision was not customary, and succeeded in inducing Riccardi *to grant permission for the printing for Rome.*[2]

[1] Op. ix. p. 188.

[2] In the narration of this most important transaction we have followed the memorial which, later on, at the beginning of the trial of Galileo, was handed to the Pope by the preliminary commission. This is an authentic document, agreeing as far as it relates to these transactions with

On the other hand, Galileo undertook to fashion the beginning and end of the work in accordance with a plan of the supreme authorities of the censorship. There were also still a few passages to be personally discussed with the author; and as he was unable to stay longer at Rome without danger to his health, which was already beginning to suffer, it was agreed that he should return in the autumn, and meanwhile[1] he would prepare the index and the dedication to the Grand Duke, and revise the preface and conclusion. The main condition, however, under which Riccardi gave the book his *imprimatur*, was that after its final completion it should be submitted to him; and in order to avoid loss of time, he engaged to look it through sheet by sheet, and to send each at once to press after inspection. As was usual in the case of members of the Accadémia dei Lincei, the work was to be published in the name of this society, and the president, Prince Cesi, was to see it through the press.

So at the end of June[2] Galileo returned to Florence with his MS. and the ecclesiastical *imprimatur*, which was granted *bona fide* for *Rome* without reserve. There were indeed sundry conditions attached to it, to be arranged privately; but they seemed to present so little difficulty, that a few days after he left on 29th June, Niccolini reported to Cioli that Signor Galileo left last Wednesday, perfectly satisfied, and with his affairs quite settled.[3]

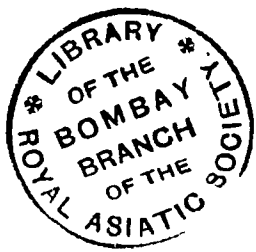
Galileo's correspondence. (Op. vi. pp. 274–277; Suppl. pp. 233–235.) It is inconceivable how Albèri (Op. Suppl. p. 238, note 2) can have fallen into the mistake of supposing that Galileo had not received the *imprimatur* at all, though he himself publishes documents which prove the contrary; as, for instance, the letter of Visconti to Galileo of 16th June, 1630 (Suppl. p. 235); Galileo's to Cioli of 7th March, 1631 (Op. vi. pp. 374–376); a letter of Riccardi's to the Tuscan ambassador at Rome, Niccolini, of 28th April, 1631 (Op. ix. pp. 243, 244); and finally, a letter from Niccolini to Cioli of Sep., 1632 (Op ix. pp. 420–423). Martin also expresses his surprise at this error of Albèri's (p. 102, note 2).

[1] Op. ix. pp. 193 and 205.

[2] Op. vi. p. 346, note 2.

[3] Wolynski, "La Diplomazia Toscana e Gal. Galilei," p. 35.

But events were now at hand which long deferred Galileo's ardent desire to see the results of his unwearied researches and labours speedily given to the world, and which involved complications afterwards taken advantage of by his enemies to effect the ruin of their great opponent.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CHAPTER II.

THE IMPRIMATUR FOR THE "DIALOGUES."

Death of Prince Cesi.—Dissolution of the Accadémia dei Lincei.—Galileo advised to print at Florence.—Difficulties and Delays.—His Impatience.—Authorship of the Introduction.—The *Imprimatur* granted for Florence.—Absurd Accusation from the style of the Type of the Introduction.

SIX weeks had scarcely elapsed after Galileo's return from Rome, when he received from his friend Francesco Stelluti the startling intelligence of the death of his influential patron, Prince Cesi, who had been snatched away on 1st August by an attack of fever, after a few days' illness.[1] This was a great blow to Galileo. It was not only that he lost in the prince an adherent, as influential as he was devoted, but his death just then was of the greatest moment on account of he "Dialogues." There was, perhaps, no one so well qualified to forward their publication as Cesi, who, as president of the Accadémia dei Lincei, seemed just the man for it. The Academy, deprived of its strongest support, was gradually dissolved, after the hand was wanting which knew how to weave its multitudinous threads into a firm and solid fabric.

Only the third week after the prince's death, Galileo felt the first effects of his heavy loss. In a letter of 24th August, Castelli urgently advised him "for many most weighty reasons which he did not wish just then to commit to paper, to have the work printed at Florence, and as soon as possible."[2] Castelli added that he had inquired of Father Visconti whether this would present any difficulties, to which he had replied that there was nothing to prevent, and he

[1] Op. ix. pp. 198, 199. [2] Ibid. pp. 201, 202.

(Visconti) desired above all things that the work should see the light. Galileo was the more ready to fall in with this proposition because the plague, which had made fearful ravages in North Italy, had now made its appearance in Tuscany, and the precautionary measures taken by the neighbouring States made all intercourse with them, and especially with the States of the Church, very tedious and often impossible. Galileo therefore at once took the needful steps for publishing his book at Florence. He applied to the Inquisitor-General of the city, to the Vicar-General, and to the political authorities for permission, and it was granted without hesitation on 11th September, 1630.[1]

Galileo next addressed himself to Riccardi; represented to him the great obstacles to publishing the work at Rome, and therefore asked permission to publish it at Florence. This was the beginning of troubles. The chief of the Roman censorship at first roundly refused, and when Galileo urged his request again, he informed him through the Tuscan ambassador at the papal court, Francesco Niccolini, that the work must be sent in for final revision as agreed upon, without which he should never have consented to the publication. Castelli also wrote to Galileo on 21st September,[2] as commissioned by Riccardi, that as his coming himself to Rome, as originally agreed upon, was rendered impossible by the outbreak of the plague, he had better send the manuscript to Riccardi, in order that he and Mgr. Ciampoli might make the final corrections. Castelli said further that Riccardi was still very favourably disposed to Galileo, and that when his work had undergone this censorship, he could send it to press in Florence as well as anywhere else. After this Galileo made inquiries whether, under present circumstances, a large packet of MSS. could be sent safely over the border. But he was

[1] Op. vi. p. 375. In the first edition of the "Dialogues," this permission to print is to be seen at the beginning of the book. They are also reproduced in the Latin translation of the work (Strasburg, 1635, in 4to).

[2] Op. ix. pp. 205, 206.

everywhere met with a negative, and the remark that mere letters scarcely passed. In vain he applied to the postmaster, in vain he appealed to the Grand Ducal secretary of state, Bali Cioli, for help; no means could be devised, under the strict close of the frontiers, whereby the bulky work could be transmitted to Rome with any prospect of safety.

Greatly disconcerted, Galileo represented this state of things to Riccardi, and offered to send, at any rate, the preface and conclusion of the "Dialogues," that the ecclesiastical authorities might alter these important parts of the work as seemed good to them, and said that he was willing to designate the Copernican views mentioned in the book as mere chimeras, paralogisms, dreams, and fantasies, which, as is well known, was afterwards actually done. As to the final revision, Galileo proposed that Riccardi should entrust it to some one at Florence. Exceedingly annoyed by all these obstacles to an early publication of his "Dialogues," Galileo at the same time asked the Tuscan ambassador, Niccolini, and his wife, who were well disposed towards him, to try and induce Riccardi, whom he had often seen at their house, to accept this proposal. And what friends and colleagues of the chief censor and other eminent men had failed in, was accomplished by the delicate mediation of a lady. On 19th October, 1630, Caterina Niccolini wrote to Galileo, that the Padre Maestro, who was heartily devoted to him, would obligingly excuse him from sending the whole work; let him send the introduction and conclusion, but on condition that the whole MS. should be revised before publication by some competent person at Florence, and by a theologian empowered by the ecclesiastical authorities, who must belong to the Benedictine order. Father Riccardi proposed Father Clement for the task. The ambassador's wife added, however, commissioned by the Master of the Palace, that if this choice were not agreeable to Galileo, he might himself propose a suitable person, who would be empowered to act.[1]

[1] See Caterina Niccolini's letter to Galileo. (Op. ix. p. 209.)

And, in fact, Father Clement was not to Galileo's taste, and he proposed Father Hyacinthe Stephani, counsellor to the Holy Inquisition at Florence, who was approved by Riccardi. This ecclesiastic revised the work very thoroughly, and—so at least Galileo reports[1]—was moved to tears at many passages by the humility and reverent obedience which the author had displayed. Having made some insignificant corrections, suggested by extra caution, he gave the "Dialogues" his approval, and declared that the famous author should be begged to publish them rather than have obstacles placed in his way.

Riccardi, notwithstanding his friendship for Galileo, seems to have been of a different opinion. The preface and conclusion had been sent, but he had allowed weeks and months to pass without letting Galileo hear anything of them, to say nothing of sending them back. Castelli once wrote to Galileo that he had met Riccardi, and that he had told him that these portions were now quite in order, and that he would send them to Galileo immediately; but months again went by without his fulfilling his promise.

Galileo was in despair, and on 7th March, 1631, addressed a long letter to Bali Cioli, in which he first related the course of the negotiations respecting the "Dialogues"[2] in detail, and then asked for the powerful intervention of his Highness the Grand Duke, at Rome, to bring the business to a conclusion, so that he (Galileo) might enjoy while he lived these fruits of the labours of over fifty years. Little did Galileo foresee what dire results these "fruits" were to bring. On 8th March his request was granted, and he was informed that Niccolini, at Rome, would be commissioned in the name of

[1] Op. vi. p. 375.

[2] In the history of these negotiations we have to a great extent followed Galileo's narrative. (Op. vi. pp. 374–377.) Besides this, we have made use of two authentic documents, the memorial of the preliminary commission, before mentioned, to the Pope (Vat. MS. fol. 387 ro.–389 vo.), and the protocol of the trial of Galileo, 12th April, 1633 (Vat. MS. 413 ro. –419 ro.)

the Grand Duke to hasten as much as possible the termination of the negotiations with the Master of the Palace.[1]

Galileo was all the more pleased with the success of this attempt, because meanwhile, weary of the long delays, he had begun to have his "Dialogues" printed. This is confirmed by a letter from him of 20th March to his learned friend, Cesare Marsili, in which he says that six sheets of his work, which would consist of fifty or more, were finished.[2] We may here remark that this proceeding of Galileo's has been the subject of severe and unjustifiable blame on the part of some authors actuated by party spirit. It seems the less called for, since Galileo made no secret of the printing having been begun, and he was not reproached for it at the subsequent trial before the Inquisition. He quite supposed that after Father Stephani had inspected and sanctioned the work, all the conditions were fulfilled. He therefore considered Riccardi's consent to the publication in Florence as certain. It never occurred to him that after all this he would raise new difficulties.

A report of Niccolini's of 19th April to Cioli[3] confirmed him in this supposition, and rejoiced his heart, as there seemed to be an immediate prospect of an end to these tiresome negotiations. Niccolini wrote that he and his wife had a little while before had a long conversation with Father Riccardi about Galileo's affairs, which had resulted in his promising to grant permission for the publication, but with the addition of a declaration, for his own protection, which he was to forward to Niccolini in a few days. On the 28th Niccolini received it, but instead of its containing the promised *imprimatur*, it required new clauses and imposed

[1] Compare the letter of Geri Bocchineri, private secretary at the Court of Tuscany, to Galileo (Op. ix. pp. 225, 226), and the letter of Cioli to Niccolini of 8th March, in which the latter is charged, in the name of the Grand Duke, to support Galileo's cause to the utmost with the Master of the Palace. (Wolynski, "La Diplomazia Toscana," etc., p. 39.)

[2] Op. vi. pp. 377, 378.

[3] Op. ix. pp. 242, 243.

fresh conditions on the publication. The chief censor indeed acknowledged, at the beginning of this letter, that he had given the *imprimatur* to the work, but stated that it was only with the reservation that the author should make some alterations as agreed upon, and send his book to Rome to be published, where with the help of Mgr. Ciampoli all difficulties would have been overcome. "Father Stephani," continues Riccardi, "has no doubt subjected the book to a conscientious revision; but as he was not acquainted with the Pope's views, he had no power to give any approval which would enable me to sanction the printing without incurring the danger both to him and myself that unpleasantnesses might arise, if things were still found contrary to the proscriptions." Riccardi then asserts that he had no greater desire than to serve the Grand Duke, but he considers that it must be done so as to prevent any danger to his Highness's reputation. And this would not be the case if he gave his *imprimatur*, as it was not his province to give it for Florence,[1] while it would be secured by his assuring himself that everything was in accordance with the commands of his Holiness. "When I have inspected the beginning and end of the work," he continued, "I shall easily discover what I want to know, and will then give a certificate that I have approved the whole work."

This sentence is, to say the least, very obscure. Riccardi had had these two portions of the work in his possession for months, and could long before have discovered from them what he wanted to know. Or had he not condescended to look at them? This seems scarcely credible, and is in direct opposition to what he said to Castelli months before. But a desire to spin the matter out is evident enough from this obscure sentence as well as the rest of the letter. The Master of the Palace then proposed, if it were still impossible to forward the work, to send the ordinances of his Holiness to

[1] The Roman censorship only granted licences to works published at Rome itself.

the Inquisitor at Florence, in order that he, after assuring himself that they had been complied with, might give the *imprimatur*. When Niccolini expressed his suspicions that these delays had been caused by some intrigues of Galileo's enemies, Riccardi assured him that no one but friends of the famous astronomer had spoken to him on the subject, and that there really had been no cabal of any sort.[1]

When Galileo received the news of this letter, which, contrary to all his expectations, once more removed all hope of an end of these transactions into the far future, he could not repress his ill humour. This is plain enough from a letter to Cioli of 3rd May. He begins with the tart remark: "I have read what the Father Master of the Palace has written about the publication of the 'Dialogues,' and perceive, to my great vexation, that after keeping me for nearly a year without coming to any conclusion, he means to pursue the same course with his Holiness, namely, to delay and spin out everything with empty words, which it is not easy to put up with." He then bitterly complains that this letter of Riccardi's, instead of the promised *imprimatur*, contains nothing but fresh delays on the pretext of conditions with which he had complied several months before, and in such a way as to prove to his Holiness and all who were willing to be convinced that he had done so. "And since I perceive," he continues bitterly, "that my affairs are afloat on a vast and boundless ocean, while the publication of my book is of the utmost importance to me, as I wish to see the fruits of my labours secured, I have been considering various ways by which it might be accomplished; but the authorization of his Holiness is indispensable for all." Galileo then says that in order to come to some result it might be of the highest importance some day, and that as soon as possible, to be summoned to appear before his Highness, with the Inquisitor and Father Stephani. He would like to show them the work with all the corrections from the hands of Fathers

[1] See this letter from Riccardi to Niccolini. (Op. ix. pp. 243, 244.)

Riccardi, Visconti, and Stephani, in order that, in the first place, they might see how trivial the alterations were, and in the second, how submissively and reverently he had designated all the evidence and arguments which appeared to confirm an opinion not approved by the authorities, as dreams, chimeras, and nullities. He concludes by saying: "Those present will then perceive how true and just my doctrines are, and that I have never entertained other views or opinions than those held by the most venerable and holy fathers of the Church."[1]

The Grand Duke, Ferdinand II., however, with all his good will towards his chief mathematician, was by no means inclined to interfere personally in the matter. He was desirous to use all the influence he possessed to bring about a decision at Rome, but it no more occurred to him now to exercise his rights as sovereign ruler, than it did afterwards when he gave up the infirm philosopher, at nearly seventy years of age, to the Roman tribunal. Galileo's suggestion, therefore, that the Grand Duke should, to some extent, take the initiative was by no means acceptable, and was not followed. The summons to the Inquisitor and Father Stephani to appear with Galileo before the Grand Duke never came; Niccolini, however, made fresh efforts to bring about a solution of the question at Rome. He went to the Master of the Palace and strongly represented to him that through the dedication the Grand Duke himself was greatly interested in the publication of this work, at the head of which his exalted name was placed.[2] Galileo finally succeeded, on 24th May, in inducing Riccardi to address a letter to Fra Clemente Egidio, the Inquisitor at Florence, in which he left it entirely to him, after examining the work, to grant permission for the publication or not. The Master of the Palace again expressly mentioned in this letter that he had given the authorization

[1] Op. iv. pp. 382–284.

[2] See Niccolini to Galileo, 25th May, 1631. (Wolynski, "Lettere inedite," etc., p. 83.)

to print, but with the reservation that the necessary alterations should be made, and that after further revision it should go to press in Rome, which conditions, however, had not been able to be fulfilled owing to the plague. The most interesting parts of the letter for us are the hints which Riccardi gives the Inquisitor, in the course of it, as to the Pope's views on the subject, which are to guide him in sanctioning the work. Title as well as contents are only to relate to the mathematical aspects of the Copernican system, and so that "the absolute truth of this view is never conceded, but made to appear as mere hypothesis, and without reference to Scripture."[1] "It must also be explained," continued Riccardi, "that this work is only written to show that all the arguments which can be adduced in favour of this view were well known; that therefore the sentence of 1616 was not to be attributed to ignorance at Rome, and the beginning and end of the book must agree with this statement, *which portions, properly arranged, I will send from here.* By observance of these precautions the work will meet with no obstacles at Rome, and your reverence will be able to gratify the author, as well as to serve his Highness, who has shown so warm an interest in the matter."[2] The Inquisitor replied on 31st May that he would act in accordance with the received instructions. He says further that he had given the MS. to Stephani, as a very eminent man and counsellor of the Holy Office, to be revised again, and this time in accordance with the papal instructions; also that Galileo consented most willingly to all the corrections.[3]

But it would almost appear as if Riccardi had again repented of the steps he had taken for the final settlement of the business, for weeks and months passed before Fra Clemente Egidio received the preface and conclusion. Not till Niccolini,

[1] . . . "Si che non mai si conceda la verita assoluta ma solamente la hipotetica, e senza la Scrittura, a questa opinione . . . "

[2] Vat. MS. fol. 390 ro.

[3] Ibid. fol. 390 vo.

at Galileo's request, had repeatedly urged him to send them, could he be induced to do so, after a further delay of two months, and then, as the ambassador graphically describes the situation, not "till formally pulled by the hair."[1] In the letter of 19th July, 1631, which accompanied them, Riccardi empowered the author to alter the style of the revised introduction as he pleased, and to ornament it rhetorically, but so that the sense should remain the same. As to the conclusion, he made the vague remark that it must be based upon the same argument as the beginning.[2]

This seems to be the place to enter into the oft discussed question of the real authorship of this remarkable introduction. Some, who rely upon the letter of Riccardi's above quoted, attribute it to him; others even maintain that it owes its origin to Urban VIII. himself; while, on the other hand, some are of opinion that Galileo had the chief share in it, though assuredly only because he considered that it would secure his object—permission to publish the "Dialogues." All these opinions contain some truth, contradictory as they seem; the truth lies between them. After careful examination of the documents relating to the subject, the historical facts appear to be as follows:—

When Galileo was at Rome in the early part of the summer of 1630, in order to submit his "Dialogues" to the Roman censorship, an introduction was sketched for him, which he was to complete at Florence, and on his intended return to Rome in the autumn to lay it and the whole manuscript before the Master of the Palace for final revision.[3] From the good understanding which then existed between Riccardi, Mgr, Ciampoli, and Galileo, and from the contents of the introduc-

[1] Letter of 19th July, 1631. (Op. ix. p. 246.)

[2] See this important letter of Riccardi's to the Inquisitor at Florence. (Vat. MS. fol. 393 ro.)

[3] See points 1 and 3 of the memorial which was handed to the Pope at the first examination of Galileo by the preliminary commission. (Vat. MS. fol. 388.)

tion, we may conclude with certainty that the sketch was made with Galileo's concurrence, or even that the main idea of it was his own. For on close examination we find that the idea on which the whole introduction turns—namely, that it was by no means ignorance of the scientific arguments in favour of the Copernican system which led to the verdict of 1616—is precisely the same as that stated by Galileo in his reply to Ingoli in 1624.[1] As we are aware, since the plague prevented Galileo from returning to Florence or sending the whole MS., he sent the introduction and conclusion to the chief censor, who kept them for months, and did not return them to the Inquisitor at Florence till 19th July. From Riccardi's letter we learn two facts: firstly, that he had only concerned himself with the introduction, leaving the conclusion to the author with the vague remark we have quoted; and secondly, that Galileo's preface must have undergone considerable alterations by the chief censor, as he gave him leave to alter the style but not the sense. There can be no more doubt that the Pope had some hand in the final composition of the preface than that it was not penned by himself. Riccardi appeals in both his *ex officio* letters to the Inquisitor of 24th May and 19th July, to the "views" and commands of his Holiness; and when the great storm afterwards burst, the Master of the Palace loudly asserted that in Galileo's affairs he had always and in everything acted in concert with the papal secretary, Mgr. Ciampoli, and the latter appealed decidedly to special commands of Urban's.[2] Riccardi and Ciampoli indeed paid for this indiscretion with the loss of their posts, but Cantor has aptly remarked on the subject that, "evidence of the falsity of a statement was never yet

[1] Comp. p. 120.

[2] Marini, p. 127. Pieralisi tries to convince the reader that Ciampoli acted quite despotically in the matter; and says that when Riccardi refers to "the Pope," it was not Maffeo Barberini, but Mgr. Ciampoli, "Giovanni Ciampoli non Maffeo Barberini era il Papa"! p. 113, a statement which, considering Urban's despotic character and the absence of historical proof, appears very arbitrary.

afforded by the fact of the witnesses being compelled to silence or suffering punishment."[1]

With the arrival at last of the preface and conclusion, all the obstacles which had threatened the continuation of the printing of the "Dialogues" were removed. Stephani, who was charged by the Inquisitor at Florence to undertake the final censorship, was not the man to place difficulties in the way of the appearance of the book. He took great care, however, that the Pope's commands as to the treatment of the Copernican doctrines should, as far as the letter went, be strictly obeyed. The "Dialogues," from beginning to end, were opposed to the spirit both of the decree of 5th March, 1616, and the papal ordinances, and there was great *naiveté* in the idea that the fine-spun preface and the various little diplomatic arts which Galileo employed in the course of his work could disguise its real meaning from the learned world. But that was not Stephani's affair; for the MS. as a whole had been sanctioned by Father Visconti and had received the *imprimatur* for Rome from the authorities of the censorship.

The delay about the preface, which, according to Riccardi's orders, was to be printed before the book, had two results out of which Galileo's enemies afterwards tried to make capital for their intrigues, and which must therefore find mention here. The printing had been long in hand and was proceeding when the preface arrived. It was therefore necessary to print it on a separate sheet, which, according to Riccardi's orders, was placed at the beginning of the book. For technical reasons, also, it was printed in different type from the rest of the work. From these two insignificant circumstances, Galileo was afterwards reproached with having by the outward form destroyed the inner connection between the introduction and the book; and with having thus, to some extent, intended to indicate that it had nothing to do with the "Dialogues."[2] This was at the time when one party was setting every lever in

[1] *Zeitschrift für Mathematik u. Physik.* 9th Series, Part 3, p. 184.

[2] Marini, pp. 116, 117; Op. Suppl. pp. 324, 325.

motion to find cause for accusation against Galileo. The book itself, which appeared with the double *imprimatur* of the ecclesiastical censorship of Rome and Florence, afforded no legal ground for it. We will not, however, anticipate the historical course of these memorable events, but will carefully follow them step by step.

CHAPTER III.

THE "DIALOGUES" AND THE JESUITS.

Publication of the "Dialogues."—Applause of Galileo's Friends and the Learned World.—The hostile Party.—The Jesuits as Leaders of Learning.—Deprived of their Monopoly by Galileo.—They become his bitter Foes.—Having the *Imprimatur* for Rome and Florence, Galileo thought himself doubly safe.—The Three Dolphins.—Scheiner.—Did "Simplicius" personate the Pope?—Conclusive Arguments against it.—Effect of the Accusation.—Urban's Motives in instituting the Trial.

By the beginning of January, 1632, the printing of the "Dialogues" was so far advanced, that on the 3rd Galileo had the satisfaction of telling his friend, Cesare Marsili, at Bologna, that the work would be completed in ten or twelve days.[1] It did not, however, appear till February. On the twenty-second of that month Galileo presented his book to the Grand Duke, to whom it was dedicated, and to the other members of the house of Medici.[2] On the twenty-third he sent at first thirty-two copies to Cesare Marsili.[3] He had a large number of copies handsomely bound for his powerful friends and patrons at Rome, but they could not be despatched immediately, since, owing to the continued prevalence of the plague, they would have had to be purified in the quarantine houses, which might have injured them. It was not till May that two unbound copies reached the papal residence in a roundabout way.[4] One of these came into the hands of Cardinal Francesco Barberini, who lent it to Father Castelli. In a letter to Galileo of 26th September, 1631,[5] he had vowed that, after the appearance of the

[1] Op. vi. p. 389. [2] Ibid. p. 390. [3] Ibid.
[4] Op. ix. p. 271. [5] Ibid. p. 253.

"Dialogues," he would read no other book but that and the Breviary; and in a letter of 29th May,[1] he now expressed to the author his admiration of his work, which surpassed all his expectations. Shortly afterwards, Count Filippo Magalotti, who was on very friendly terms with Galileo, and from his relationship to the Barberinis, was an influential personage, imported eight copies from Florence, and, as charged by the author, presented one copy each to Cardinal Antonio Barberini, to the Tuscan ambassador Niccolini, Father Riccardi, Mgr. Serristori, counsellor of the Holy Office, and the Jesuit Father Leon Santi.[2]

While these few copies were being eagerly devoured by impatient readers at Rome, and passed rapidly from hand to hand, the book had been circulating in the rest of Italy in spite of the difficulties of communication. The applause which this famous work called forth from all men of independent minds was unexampled, and was only equalled by the bitterness and consternation it excited among the scientific conservatives. The learned world of Italy was divided into two hostile camps: that of Ptolemy on the one side, that of Copernicus-Galileo on the other. In the one were to be found progress, recognition of truth, free independent thought and research; in the other blind worship of authority and rigid adherence to the old school. And the latter party was far the most numerous; it was also reinforced by those, of whom there were a considerable number, who opposed the great reformer of science from interested motives. Besides this, the academic corporations were not favourable to him, because he so dangerously revolutionised the modern methods of teaching. The university of his native city seemed especially adverse to him. It had carried its animosity so far a few years before as to try to deprive him of the income which he enjoyed as its first mathematician by the Grand Ducal decree of 12th July, 1620, though, thanks to

[1] Op. ix. pp. 270–272. [2] Op. Suppl. p. 319.

the energetic remonstrances of some influential patrons, the attempt was not successful.[1]

In addition to all this there is another consideration, which played a much larger part in the sad story of Galileo's trial than is generally supposed. The clergy, and especially the Jesuits, had hitherto had a monopoly of science. Everybody knows how assiduously it had been cultivated in ancient times in the cells and schools of the convents, and that the ecclesiastical orders were the guardians and disseminators of learning, while among both populace and nobles ignorance flourished like a weed. When by the natural law of progress the nations of Europe emerged from the simplicity of childhood into the storm and stress period of youth; when inventions,—especially printing,—and above all the discovery of America, began to spread knowledge and culture among the masses, it was once more the servants of Rome who, justly estimating the spirit of the age, placed themselves, so to speak, in the van of the intellectual movement, that they might guide its course. The strongest evidence that the Church was in exclusive possession of the highest mental powers is afforded by the Reformation; for the first stirrings of doubt, of critical, philosophical speculation, arose in the bosoms of the Roman Catholic clergy. All the reformers, from Abelard and Arnold of Brescia, to Huss and Luther, sprang, without exception, from among them.

Just at the juncture when the split into two creeds threatened to divide the joints and marrow of the supreme power of the Church, the man appeared who most effectually contributed to restore it by founding a new ecclesiastical order, with a very peculiar organisation. This was Ignatius Loyola. And if we seek for the explanation of the profound influence gained by this corporation in all parts of the world, and every grade of society, we shall find it in four factors: the highest enthusiasm for the common cause; willing

[1] Comp. Nelli, vol. i. pp. 504, 505; Op. vi. p. 104, note 2; ix. pp. 163–165, 192; Suppl. p. 234.

obedience to the central authority—the general for the time being; utter unscrupulousness as to means; and the supremacy which knowledge always confers. Far from occupying themselves, like the Protestant clergy, exclusively with theology, there was no branch of knowledge that was not cultivated by these champions of the Church; indeed they stood for a century at the summit of learning.[1] And now, in the most recent epoch of that stigmatised century, Galileo the layman steps forth upon the arena of the science of the heavens and the earth, and teaches the astonished world truths before which the whole edifice of scholastic sophistry must fall to the ground. The Jesuit monopoly of the education of youth and of teaching altogether, became day by day more insecure, and the influence of the society was threatened in proportion. Was it to be wondered at that the pious fathers strained every nerve in this final conflict for mastery, and in the attempt to prevent their world-wide mission of educating the people from being torn from their hands? This explains why the reformers of science appeared just as dangerous to them as those of religion; and they resisted the former, as they had done the latter, with all the resources at their command.

Galileo, as one of the most advanced pioneers of science, was in the highest degree inconvenient to the Jesuits; members of their order had also repeatedly measured lances with the great man in scientific discussion—Fathers Grassi and Scheiner, for instance—with very unfortunate results, by no means calculated to make the Society of Jesus more favourable to him. But now that his "Dialogues on the Two Systems of the World" had appeared, which, as every intelligent man must perceive, annihilated with its overwhelming mass of evidence the doctrines of the old school, and raised the modern system upon its ruins, the Jesuits set every

[1] Comp. on this subject the chapters on "Die Gesellschaft Jesu" in "Kulturgeschichte in ihrer natürlichen Entwicklung bis zur Gegenwart," by Fr. v. Hellwald, Augsburg, 1874, pp. 691–966.

lever in motion, first to suppress this revolutionary book, and then to compass the ruin of the author.

Riccardi himself remarked to Count Magalotti at that time: "The Jesuits will persecute Galileo with the utmost bitterness."[1]

Besides, they found welcome allies in the overwhelming majority of the rest of the clergy. With them the theological considerations we have mentioned formed the motive. And the louder the applause with which the independent scientific world greeted Galileo's latest remarkable work, the fiercer burnt the flame of ecclesiastical hate. There can be no doubt that the full significance of the "Dialogues" had not been apprehended by any of the censors to whom they had been submitted. This is obvious from the fact that they seriously thought that the diplomatic preface, and a few phrases in the work itself, would suffice to make it appear innocuous. The commotion made by the book in the scientific and theological world convinced them of their mistake.

Meanwhile, Galileo in Florence gave himself up to unmixed delight at the brilliant success of his "Dialogues." His learned friends and followers, such as Fra Bonaventura Cavalieri, Giovan Batista Baliani, Castelli, Fra Fulgenzio Micanzio, Alfonzo Antonini, Campanella, and many others, expressed to him in repeated letters, and often with genuine enthusiasm, their admiration of his splendid work;[2] not one of them had any foreboding that it was to bring its grey-headed author before the bar of the Inquisition; and Galileo himself least of all. He expected violent opposition from his scientific opponents, and was prepared to engage in the contest, but he considered himself quite secure from ecclesiastical persecution. Had not influential personages at Rome, Cesi, Mgr.

[1] . . . "I Gesuiti lo persequiterano acerbissimamente." (See Magalotti's letter to Mario Guiducci, from Rome, of 7th Aug., 1632. Op. Suppl. p. 321.)

[2] See their letters. (Op. ix. pp. 264–267, 270–272, 276–282.)

Ciampoli, Cesarini, and Castelli, been urging him for years to finish his work, the tendency of which they well knew?[1] And when it was at last complete, it was these same friends, as well meaning as they were influential, who had done their best to forward the publication. Besides, the book had appeared not only with the *imprimatur* and under the protection of the Inquisition at Florence, as prescribed, and with the permission of the political authorities of the city, but Galileo could show also the *imprimatur* of the Pater Magister Sacri Palatii, which was not at all usual with works not printed at Rome.[2] He considered this a double security; Jesuitism, on the contrary, contrived afterwards to forge an indictment out of this unusual circumstance. Not a word had appeared in print without having been read by the organs of papal scrutiny and having received the sanction of the Church. Might not the author well look forward to the publication of his work with perfect tranquillity, and feel himself secure from any collision with the ecclesiastical authorities? Undoubtedly, if he had not made the solemn promise sixteen years before, "*entirely to renounce the opinion that the sun is the centre of the universe, and is stationary, and that the earth on the contrary moves, and neither to hold the same, nor in any way to teach or defend it in speaking or writing.*"

Galileo's proceedings at this time, as before and after, prove that he was totally unaware of this assumed prohibition; anyhow, he pays not the slightest attention to it. He sends

[1] See their letters to Galileo. (Op. ix. pp. 25, 72, 97, 166–168, 174–177, 210, 255; Suppl. p. 181.)

[2] On the reverse side of the title page of the "Dialogues" stands:—
"Imprimatur, si videbitur Rever. P. Magistro Sacri Palatii Apostolici.
A. Episcopus Bellicastensis Vices gerens.
Imprimatur. Fr. Nicolaus Ricardus, Sacri Apostolici Palatii Magister.
Imprimatur Florentiæ; ordinibus consuetis servatis. 11 Septembris 1630.
Petrus Nicolinus Vic. Gen. Florentiæ.
Imprimatur. Die 11 Septembris 1630.
Fra Clemens Egidius Inquisit. Gen. Florentiæ.
Stampisi. A. di 12 di Settembre 1630. Niccolò dell 'Altella."

copies of his work to the most eminent persons at Rome; is delighted at its immense success; arms himself for defence against the indignant Aristotelians, but never thinks of a conflict with the ecclesiastical authorities, which, sincere Catholic as he was, would have given him great pain apart from consequences. Even in June and July there were some ill-disposed persons, to the great annoyance of Riccardi, zealously trying to discover something in the book which could be formulated into an accusation against the author. The title page was adorned with a drawing of three dolphins, one with the tail of another in its mouth, with an insignificant motto above it.[1] This illustration was impugned because it had not been submitted to ecclesiastical approbation, and they expatiated with more malice than wit upon the meaning of the mysterious device. It was a great relief to Riccardi's mind when it was pointed out by Count Magalotti that the same illustration appeared on almost all the works which issued from the press of Landini at Florence, where the "Dialogues" had been printed. This bait, then, had not taken, and Galileo's foes, worthy members of the Society of Jesus, had to find some other mode of ensnaring him. They now brought against him the twofold reproach, that the preface was printed in different type from the rest of the book, which was true; and that several weighty arguments which the Pope had brought against the Copernican system in conversation with Galileo, though they might perhaps have been adduced in the MS., were not in the printed book; this was a lie.[2] The truth however at once came to light, for these "weighty arguments" were reduced to one, which was brought forward at the conclusion of the "Dialogues." But Jesuitism, as we shall soon see, drew very singular conclusions from the very natural circumstance that it was mentioned by Sim-

[1] It is reproduced in Venturi, vol. ii. p. 117.

[2] See on all this the two detailed letters of Count Magalotti to Mario Guiducci, from Rome, of 7th August and 4th September, 1632. (Op. Suppl. pp. 318–329.)

plicius, the defender of Ptolemy. The brethren of Father Grassi and Father Scheiner,[1]—the latter of whom had been for a few months at Rome, and was greatly incensed at the "Dialogues,"—well knew how to lay hold of the Pope by his most vulnerable points, his personal vanity and boundless ambition, which made him feel every contradiction like an attack on his authority. They were assiduous in confirming Urban in his opinion that the Copernican doctrine endangered the dogmas of the Christian Catholic faith in the highest degree, and now represented that the publication of the "Dialogues" was an incalculable injury to the Church. Besides this, they persuaded the Pope that in his latest work Galileo had again, though this time under concealment, entered into theological interpretations of Holy Scripture. They thus stigmatised him as a rebel against the papal decrees, who had only obtained the licence from Riccardi by

[1] Scheiner had two years before published a work called "Rosa Ursina," in which he again fiercely attacked Galileo, and stoutly maintained his unjustifiable claims to the first discovery of the solar spots. Galileo did not directly answer him in his "Dialogues," but dealt him some side blows, and stood up for his own priority in the discovery with weighty arguments. Castelli, in a letter to Galileo of 19th June, 1632 (Op. ix. p. 274), gives an amusing description of Scheiner's rage. When a priest from Siena praised the book in his presence at a bookseller's, and called it the most important work that had ever appeared, Scheiner left the shop, pale as death, and trembling with excitement in every limb. But he did not always thus curb his rage. The natural philosopher, Torricelli, who afterwards became famous, a pupil of Castelli's, reported to Galileo, in a letter of 11th September, 1632 (Op. ix. p. 287), a conversation he had had with Scheiner about the "Dialogues." Although he shook his head about them, he had concurred in Torricelli's praise, but could not help remarking that he found the frequent digressions tedious; and no wonder, for they often referred to himself, and he always got the worst of it. He broke off the conversation by saying that "Galileo had behaved very badly to him, but he did not wish to speak of it." In a letter of 23rd February, 1633, to Gassendi (Op. ix. p. 275), Scheiner is less reserved. Rage and fury evidently guided his pen, and he complains bitterly that Galileo had dared in his work to "lay violent hands" on the "Rosa Ursina." Scheiner was doubtless one of the most zealous in instituting the trial against Galileo, although Targioni (vol. i. p. 113, note *a*) overshoots the mark in making him his actual accuser.

cunning devices,—a misrepresentation of the facts which, however, did not fail of its effect on Urban. This is conclusively proved by the despatches of Niccolini to Cioli of 5th and 11th September, 1632, of which we shall have to speak more particularly.[1]

The crowning point of the intrigues of Galileo's foes was, however, the cunning assertion that *by Simplicius no other was intended than Urban VIII. himself;* and they actually made him believe it. One would scarcely have thought this possible with this shrewd Pope, who was so well-disposed towards Galileo; but it is beyond all question that it was so, and it put him in a boundless rage. It is decidedly indicated by his attitude towards Galileo at the trial, especially at the beginning of it. At that time it put him in such ill humour to be spoken to about Galileo, that all who interested themselves for him agreed that it was better not to confer with Urban himself, but with Cardinal Barberini or the ministers.[2] The repeated attempts also made by Galileo and his friends, even years afterwards, to convince Urban that it had never entered his head to insult him, and that it was a cunning slander, prove that for a long time the Pope had taken Simplicius for his counterfeit.

As this manifest falsehood is revived by certain writers, even at this time of day, as having been Galileo's real intention, it seems necessary to throw a little more light on it. The telling remarks which Albèri makes on the subject might well suffice to show the absurdity of the imputation. He says that in the first place the attachment and devotion always shown by Galileo towards Urban, to the sincerity of which numerous letters bear witness, exclude all idea of so perfidious an act; and in the second, that it was Galileo's own interest to retain the goodwill of his powerful patron, and not frivolously to

[1] Op. ix. pp. 420–425.

[2] See Magalotti's letter to Guiducci of 4th September, 1632 (Op. Suppl. p. 324); and Niccolini's report to Cioli of 5th September (Op. ix. p. 422).

fritter it away.[1] But we pass from this argument *ad absurdum* to one *ad concretum*. Simplicius is said to be Urban VIII. But not appropriately, for he was no such headstrong Peripatetic as is represented by Simplicius; had he been so, it was impossible that in 1624 he should have enjoyed having "Il Saggiatore" read to him at table, that cutting satire on the Aristotelian wisdom in general, and the wisdom of Father Grassi in particular; and that in the next year he should have been so much pleased with Galileo's reply to Ingoli.

Galileo's enemies founded their assertion on the circumstance that at the end of the work Simplicius employs an argument which the Pope himself had brought forward in repeated conversations in 1624 with Galileo, and on the weight of which he plumed himself not a little.[2] It consisted of the reflection, undoubtedly more devout than scientific, that God is all-powerful, so that all things are possible to Him, and that therefore the tides could not be adduced as a *necessary* proof of the double motion of the earth without limiting His omnipotence. This pious objection is received by both Salviati and Sagredo with the utmost reverence. The former calls it heavenly and truly admirable, and the latter thinks that it forms a fitting conclusion to the discussion, which opinion is acted upon.[3] The Pope's argument is thus by no means made to appear ridiculous, but quite the contrary. As to the main point, Simplicius says expressly that "he had this argument from a very eminent and learned personage." If this means Urban VIII., it is plain that Simplicius cannot be Urban VIII. Q.E.D.[4]

In writing his "Dialogues," Galileo found himself in a difficult position. As he brought forward all the arguments

[1] Op. ix. p. 271, note 1.

[2] Comp. Niccolini's report to Cioli of 13th March, 1633. (Op. ix. p. 437.)

[3] Op. i. "Dialogo di Galileo Galilei," etc., p. 502.

[4] This point has been recently thoroughly discussed by Henri Martin. Comp. pp. 159–168.

of the disciples of Ptolemy against the new system, the vain pontiff would have been sorely offended if he had not introduced his. But who should mention it, if not Simplicius? Galileo might think that Urban would not perhaps like to see his argument treated as the original suggestion of Simplicius, who did not appear in a brilliant light, and devised the expedient of making him quote it, as that of "a very eminent and learned personage," whereby he would imagine that he had steered clear of every obstacle. But there was no security against calumny. How little idea Galileo could have had of making Urban ridiculous under the guise of Simplicius appears also from the fact that in 1636, when seeking full pardon from the Pope, and when he would be most anxious not to irritate him, he had just completed his famous work, "Dialogues on the Modern Sciences," in which Simplicius again plays the part of defender of the ancient principles; and that he published it in 1638, just when, in view of the unfavourable answer of 1636, he was begging at least for the favour of being nursed at Florence. There can be no doubt that this suspicion materially contributed to injure Galileo's cause. Pieralisi, indeed, makes an assertion as novel as it is untenable, that this bold slander was first heard of in 1635, and therefore not until after the famous trial; and in his book, "Urban VIII. and Gal. Galilei,"[1] he devotes a chapter of forty-six pages to prove this latest novelty. But all his arguments are upset by the following passage by Galileo in a letter to his friend Micanzio on 26th July, 1636:—

"I hear from Rome that his Eminence Cardinal Antonio Barberini and the French ambassador have seen his Holiness and tried to convince him that I never had the least idea of perpetrating so sacrilegious an act as to make game of his Holiness, as my malicious foes have persuaded him, and which was the primary cause of all my troubles."[2]

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[1] Pages 34–38, etc.

[2] . . . "Che fu il primo motere di tutti i miei travagli." (Op. vii. p. 71.)

Pieralisi is acquainted with these words, and seeks to weaken their indisputable force as evidence in a lengthy disquisition; but an impartial critic only sees in this the apologist of Urban VIII., who desires, at all hazards, to shield him from the suspicion of having been actuated in the matter of Galileo's trial by personal motives, which will always be recognised in history as a fact, though it is also an exaggeration of some historians to maintain that it was the actual starting-point of the whole process, Urban having wished to revenge himself for this assumed personal insult.[1] No, it had its effect, but was not the chief motive. The Jesuits had inspired the Pope with the opinion that the "Dialogues" were eminently dangerous to the Church, more dangerous and abhorrent even than the writings of Luther and Calvin,[2] and he was highly incensed at the representation that Galileo had shamefully outwitted Father Riccardi, Mgr. Ciampoli, and even his Holiness himself, in obtaining the licence. Offended majesty, the determination to guard the interests of the Church and the authority of the Bible, indignation at Galileo's assumed cunning, and annoyance at having been duped by it, —these were the motives which impelled Urban VIII. to the deed called the institution of the trial of the Inquisition against Galileo.

[1] This erroneous idea is found among a large number of historians; for instance, Biot (*Journal des Savans*, July-Oct. 1858), pp. 464, 465; Philarète Chasles, pp. 129, 130, 208; Reumont, p. 336; and Parchappe, p. 206. Epinois (pp. 56, 57) and Martin (pp. 159-168) have merely given the importance to this circumstance which it deserves, for it really was of great moment in the course of the trial.

[2] " . . . E da buona banda intendo i Padri Gesuiti aver fatto impressione in testa principalissima che tal mio libro è piu esecrando e piu pernicioso per Santa Chiesa, che le scritture di Lutero e di Calvino . . . " (Letter from Galileo to Elia Diodati of 15th Jan., 1633, Op. vii. p. 19. Comp. also his letter to King Ladislaus of Poland, Op. vii. p. 190.)

CHAPTER IV.

DISCOVERY OF THE ABSOLUTE PROHIBITION OF 1616.

Symptoms of the Coming Storm.—The Special Commission.—Parade of Forbearance.—The Grand Duke intercedes for Galileo.—Provisional Prohibition of the "Dialogues."—Niccolini's Interview with the Pope and unfavourable Reception.—Report of it to Cioli.—Magalotti's Letters.—Real Object of the Special Commission to find a Pretext for the Trial.—Its Discovery in the Assumed Prohibition of 1616.—Report of the Commission and Charges against Galileo.

As we have seen, even during the months of June and July a ferment had already begun in certain circles at Rome about the "Dialogues." Complaints and accusations were rife, the Pope was artfully worked upon—these were the first portents of the heavy storm which was to break over Galileo's head. The Master of the Palace went about Rome in great fear for himself as well as for Galileo, and told his troubles to Count Magalotti.[1] At the beginning of August, Riccardi begged him to deliver up the eight copies of the "Dialogues" which Magalotti had brought to Rome, with the assurance that he would return them in ten days at the latest. It was not in Magalotti's power to grant this request, the books having, as we know, long ago passed into other hands.[2]

A few days later the first thunderclap broke over Galileo. His publisher, Landini, at Florence received instructions, though for the time they were only provisional, forbidding the further sale of the "Dialogues." The succeeding scenes

[1] See the letter of Magalotti to Guiducci, before mentioned, of 7th August, 1632. (Op. Suppl. pp. 318–323.)

[2] Op. Suppl. p. 319.

of the melancholy drama quickly followed. A special commission was instituted at Rome by order of the Pope to investigate the whole affair. Urban afterwards repeatedly stated with great emphasis to Niccolini, that it was out of regard for the Grand Duke, as well as for Galileo, that the very unusual measure was taken of not referring his cause directly to the Holy Office, but to a separate congregation.[1]

It is altogether a characteristic trait in all the proceedings of the Roman curia against Galileo, that there was a parade of great consideration for and forbearance towards him although strictly within the limits of their real intentions. Even the favour ostensibly shown to him of referring his cause to a preliminary commission, composed of theologians and mathematicians, was not so great in reality as it was trumpeted to be at the Vatican. It was composed of persons by no means favourable to him, and all the endeavours of Niccolini and other powerful friends of Galileo to have influential persons who were friendly to him put on the commission, such as Fathers Castelli and Campanella, were frustrated by the Pope. It occasioned a dangerous threat to be held over the undaunted Campanella, who energetically exerted himself in the matter.[2]

Meanwhile disquieting rumours had reached Florence, and Galileo recognised with terror his dangerous position, though not to its full extent; this perhaps was as yet foreseen by no one. He appealed in full confidence to his friendly young sovereign for protection, and found a willing ear. On the 24th August a note on this business was sent to Niccolini, by order of the Grand Duke. It is clear that Ferdinand's efforts to assist Galileo were sincere from the circumstance that, although the letter was written in

[1] See the despatches of Niccolini to Cioli of 5th and 18th Sep., 1632. (Op. ix. pp. 422 and 426.)

[2] See Campanella's letters to Galileo of 31st August and 25th Sep., 1632. (Op. ix. pp. 284 and 294.)

Cioli's name, Galileo was the author of it, as appears from the original draft in his handwriting in the Palatina Library at Florence.

The Grand Duke in this letter expresses his surprise that a book which had been laid before the supreme authorities at Rome by the author in person, had been carefully read there again and again, as well as afterwards at Florence, and at the author's request had been altered as seemed good to the authorities, and had finally received the *imprimatur* both there and here, should now after two years be considered suspicious and be prohibited. The astonishment of his Highness was the greater, because he knew that neither of the main opinions treated of were positively confirmed, but only the reasons for and against brought together ; and this was done, as his Highness knew for certain, for the benefit of the Holy Church itself, in order that on subjects which in their nature are difficult to understand, those with whom the decision rests may see, with less expenditure of time and trouble, on which side the truth lies, and bring it into agreement with Holy Scripture. The Grand Duke was of opinion that this opposition must be directed rather against the person of the author than against his book, or this or that opinion, ancient or modern. In order, however, to convince himself of the merits or misdemeanours of his servant, his Highness desires that that which is granted in all disputes and before all tribunals should be permitted to him,—to defend himself against his accusers. The Grand Duke therefore urges that the accusations brought against the work, which have caused it to be prohibited, may be sent here for the author, who stands firmly on his innocence, to see them. He is so convinced that all this originates in the calumnies of envious and malicious persecutors, that he has offered his sovereign to leave the country and renounce his favour unless he can palpably prove how pious and sincere his sentiments on these subjects have always been and still are. The letter concludes with the commission, by the Grand Duke's orders, to take the

necessary steps towards the fulfilment of his most reasonable request.[1]

On the same day on which this despatch went off, a mandate was issued from Rome, which not only confirmed the provisional prohibition of the "Dialogues," but requested Landini to send all the copies in stock to Rome. He replied that all the copies had been delivered to the purchasers.

Niccolini on receipt of the Grand Duke's order hastened to carry it out, but met with more bitter and obstinate opposition than either he or the Tuscan court had expected. On 4th September, when the ambassador was about to execute his mission at the Vatican, the Pope met him bluntly with the words: "Your Galileo has ventured to meddle with things that he ought not, and with the most important and dangerous subjects which can be stirred up in these days." Niccolini remarked that the philosopher had not published his work without the approval of the Church, to which the Pope angrily rejoined that Galileo and Ciampoli had deceived him, especially Ciampoli, who had dared to tell him that Galileo would be entirely guided by the papal commands, and that it was all right; he had not either seen or read the work, and this was all he had known about it. His Holiness then made bitter complaints against the Master of the Palace, adding, however, that he had been deceived himself, for he had been enticed by fair speeches to approve the book, and by more fair speeches to allow it to be printed at Florence, without at all complying with the form prescribed by the Inquisitor, and with the name of the Roman censor of the press, who had nothing whatever to do with works which did not appear at Rome. Niccolini then ventured to say, that he knew that a special congregation was appointed to try this affair, and as it might happen (as was the case) that there might be persons on it unfavourable to Galileo, he humbly petitioned that Galileo might have an opportunity of justifying himself. Urban answered curtly: "In these affairs of

[1] Op. vii. pp. 3, 4.

the Holy Office, nothing is ever done but to pronounce judgment, and then summon to recant." "Does it not then appear to your Holiness," answered the ambassador, "that Galileo should be informed beforehand of the objections to, scruples and criticisms respecting his book, and of the points to which the Holy Office takes exception?" "The Holy Office," replied the Pope, angrily, "as I told you before, does not proceed in that way, and does not take that course, nor does it ever give such information beforehand: it is not the custom. *Besides, Galileo knows well enough what the objections are, if he only chooses to know, because we have talked to him about it, and he has heard them all from ourself.*" Niccolini now urged that the work was dedicated to the Grand Duke, and written by one of his most eminent servants; he hoped, therefore, that Galileo would be treated with indulgence. Urban replied that he had even prohibited books dedicated to himself, and that in matters where it was a question of endangering religion, the Grand Duke also was bound, as a Christian prince, to co-operate in enforcing penalties. Niccolini had therefore better write plainly to his Highness that he (the Pope) warned him not to meddle with things which he could not come out of with honour. The undaunted ambassador now expressed his conviction that his Holiness would not allow them to go so far as entirely to prohibit the book, which had received sanction, without at least hearing Galileo. But Urban replied, *that this was the least that could happen to him, and he had better take care that he was not summoned before the Holy Office.* The Pope then assured Niccolini that the preliminary commission was composed of theologians and men well versed in science, all grave and pious men, who would weigh every particular, word for word, for it was a question of the most godless business which could ever be discussed. He also charged the ambassador to tell his sovereign that the doctrine was in the highest degree sinful; everything would be maturely considered; his Highness had better not interfere, and must be on his guard. In conclu-

sion, the Pope not only imposed the strictest secrecy on Niccolini as to what he had been told, but desired that the Grand Duke also should be charged to keep the secret, adding that he "had acted with great consideration for Galileo, by having impressed upon him what he knew before, and by not referring his affairs, as he ought to have done, to the Holy Office, but to a specially-appointed congregation." Urban added the bitter remark that his behaviour towards Galileo had been far better than Galileo's towards him, for he had deceived him.

In the narration of the whole of this interesting conversation between the Pope and the Tuscan ambassador, we have given an almost literal translation of the Italian original of Niccolini's report of it to Cioli, of 5th September, 1632.[1] Urban's last angry expression caused Niccolini to remark in his despatch that he found "ill will here too; and as for the Pope, he could not be more against poor Galileo than he was." He then said that he had communicated Cioli's letter of 24th August to the Master of the Palace, and that Riccardi thought they would hardly condemn the "Dialogues" altogether, but only alter some passages which really were objectionable. He had also offered, as far as he could do so without incurring censure or transgressing rules, to inform the ambassador at once of what was going to be done, adding however, that he must be cautious, for he had already felt the lash in this matter. He then complained that they had not acted in accordance with his letter to the Inquisitor, that the introduction was printed in different type from the rest of the work, and that the conclusion did not agree with the introduction. Towards the end of the despatch, Niccolini says that "it will be better to act without any temper in this business, and rather to negotiate with the ministers and Cardinal Barberini than with the Pope himself, because he obstinately persists that it is a hopeless case, and if you dispute it, or threaten any-

[1] Op. ix. pp. 420–423.

thing, or are defiant, his Holiness lets fall hard words and has no respect for anybody."

The conclusion of Cioli's reply of 19th September to this ominous despatch of Niccolini's gives us an insight into the attitude which the Tuscan Government, even at that time, desired to assume towards the papal chair in this unfortunate business. Cioli writes :—

"His Highness has heard the letters of your excellency of the 4th and 5th, and by this affair of Signor Mariano and that of Signor Galileo he was placed in so much difficulty that I do not know how it will be. I know well that his Holiness will never have to blame the ministers for giving bad advice."[1]

Two letters from Count Magalotti,[2] who was usually well informed, arrived almost at the same time as this despatch. Both bear the date of 4th September; one is to Mario Guiducci, the other to Galileo, who in a letter of 23rd August, which is lost, had expressed his anxiety to Magalotti lest his work should be pronounced suspicious, and the Copernican doctrine condemned as heretical by the authorities. Magalotti's news was, on the whole, reassuring. According to the opinions of persons who are generally present at the sittings of the Congregation of the Holy Office, he thought he could assure Galileo that it would never go so far as for the Copernican system to be condemned by the *supreme authority*.[3] He thought, with Riccardi, that they would not entirely prohibit the "Dialogues," but only correct them, so as to sustain the decree of 5th March, 1616. He also urgently advised, like Niccolini, that they should arm themselves with the ut-utmost patience, and rather confer with Cardinal Barberini

[1] Il Serenissimo Padrone ha sentito le lettere di V. E. de 4 et 5, et per questa materia del Sig. Mariano e per quella del Sig. Galileo resta in tanta alterazione chio non so come le cose passarano; so bene che S. Santita non havera mai cagione di dolessi de ministri ni de mali consigli lora. (Wolynski, "La Diplomazia Toscana," etc., p. 45.)

[2] Op. Suppl. pp. 324–330.

[3] It never did in fact come to this; for the *supreme authority* is the Pope, speaking *ex cathedra*, or an Œcumenical Council.

than with Urban, "for reasons which it is not necessary to discuss here."

Neither Galileo himself, nor Magalotti, nor his other friends, ever thought of any personal danger to him; Niccolini and the Grand Duke might perhaps have been more sharp-sighted, but they were bound to silence. The threads, however, of this great intrigue can only be disentangled by the later historian, who has watched the progress of the whole melancholy drama. Two facts are perfectly obvious to the attentive observer: the first, that at Rome, with the Pope at their head, they were determined to bring Galileo to trial before the Inquisition; and the second, that they did not yet clearly see how it was to be done with some shadow of justice. To find this out was the real purpose of the appointment of the special congregation, which Urban had boasted of as a signal act of forbearance towards Galileo. All the objections to the book were subjects rather for accusation against the censors who had sanctioned it than against the author, who had submitted it to them, altered it, and again submitted the alterations. The responsibility for the publication really rested not with the author, but with those who had sanctioned it. The Pope's accusation, however, that Galileo had coaxed them to give the permission by fair speeches, was too indefinite to institute a trial upon, and neither did the irregular quotation of the *imprimatur* of the Master of the Palace, nor the typographical difference between the preface and the rest of the book offer sufficient ground for a legal prosecution. In this difficult case, therefore, it required all the Romish craft and legal sophistry at command, to find a pretext for bringing Galileo to trial before the Inquisition, which should, at any rate according to Romish principles, justify it in the eyes of the world.

The preliminary commission appointed by Urban VIII. was to perform this by no means easy task in brilliant style. It was certainly very much lightened by a discovery in the acts of the trial of Galileo in 1616, which was evidently a surprise to them—the note of 26th February, 1616.

What vast importance they at once thought fit to assign to this annotation without signature, we learn from a despatch of Niccolini's to Cioli, of 11th September.[1] Niccolini refers in it to a recent interview with the Master of the Palace. He had again strongly advised that nothing be done in a hurry, and that time must be gained, for the Pope was firmly convinced that religion was really imperilled, for the work did not treat of mathematics, but of Holy Scripture, religion, and faith, and the orders respecting the printing of the work had not been complied with, for the opinion of the author was not merely indicated, but expressed in many places in the most decided and unsuitable manner. After Riccardi had assured the ambassador that all efforts to get Campanella and Castelli put on the preliminary commission had failed, but that he (Riccardi) would do his best to defend Galileo, both from friendship for him, and to serve his Highness, and because he had given the permission to print, he confided to Niccolini, under seal of profound secrecy, as of the highest importance, *"that it had been discovered in the books of the Holy Office, that sixteen years ago, it having been heard that Galileo entertained that opinion, and disseminated it in Florence, he was summoned to Rome, and forbidden by Cardinal Bellarmine, in the name of the Pope and the Holy Office, to hold that opinion, and this alone is enough to ruin him entirely."*[2]

This communication of Riccardi's contains an obvious mis-statement, namely, that any document had been found showing that Galileo had been *summoned* to Rome in 1616. As we have seen,[3] all the historical documents show that

[1] Op. ix. pp. 423–425.

[2] . . . "Ma sopra tutte le cose dice, con la solita confidenza e segretezza, essersi trovato ne' libri del S. Offizio, che circa a 16 anni sono essendosi sentito che il Signor Galilei aveva questa opinione, e la seminara in Fiorenza, e che per questo essendo fatto venire a Roma, gli fu proibito in nome del Papa e del S. Offizio dal Signor Cardinale Bellarmino il poter tenere questa opinione, *e che questo solo è bastante per rovinarlo affatto.*"

[3] Comp. pp. 71, 72.

he was not summoned, but that his visit was entirely voluntary. This verbal statement of Riccardi's, unsupported by any document, is of no value as evidence, compared with the letters of Galileo of that period, and his depositions afterwards before his judges, who were accurately informed of all the previous proceedings. The second part of his communication to Niccolini is also far from precise. He does indeed say that Galileo, in 1616, had in the name of the Pope and the Holy Congregation been forbidden (*prohibito*), "il poter tenere questo opinione," but according to the father's account this prohibition was communicated to him by Cardinal Bellarmine. Riccardi is evidently not precisely instructed, and does not know that, according to the notification of 26th February, 1616, Galileo received an absolute prohibition before notary and witnesses.

We shall see the part this "document" was destined to play in the proceedings against Galileo.

The preliminary commission had just then, after about a month's session, completed its labours, and submitted to the Pope a long memorial on the Galileo affair. The document begins with a concise statement of the course of the negotiations about the publication of the "Dialogues," and then the three following indictments were brought against the author:—

(1) Galileo has transgressed orders in deviating from the hypothetical treatment by decidedly maintaining that the earth moves and the sun is stationary. (2) He has erroneously ascribed the phenomena of the tides to the stability of the sun and the motion of the earth, which do not exist; (3) and he has further been deceitfully silent about the command laid upon him by the Holy Office, in the year 1616, which was as follows: "To relinquish altogether the said opinion that the sun is the centre of the world and immovable, and that the earth moves; nor henceforth to hold, teach, or defend it in any way whatsoever, verbally or in writing, otherwise proceedings would be taken against him by the

Holy Office, which injunction the said Galileo acquiesced in and promised to obey."

Then follows the remark: "It must now be considered what proceedings are to be taken, both against the person of the author and against the printed book." Yet the nature of these proceedings is not in any way discussed in the document, but it now refers more in detail in five counts to the historical events, from the time when the "Dialogues" were submitted in Rome in 1630, to the publication in Florence in 1632. A sixth count considers that the following points in the "Dialogues" themselves must be laid to the author's account:—

"1. That without orders and without making any communication about it, he put the *imprimatur* of Rome on the title page.

"2. That he had printed the preface in different type, and rendered it useless by its separation from the rest of the work; further, that he had put the saving clause at the end in the mouth of a simpleton, and in a place where it is hard to find; that it is but coolly received by the other interlocutor, so that it is only cursorily touched upon, and not fully discussed.

"3. That he had very often in the work deviated from the hypothesis, either by absolutely asserting that the earth moves, and that the sun is stationary, or by representing the arguments upon which these views rest as convincing and necessarily true, or by making the contrary appear impossible.

"4. That he had treated the subject as undecided, and as if he were waiting for, though he does not expect, explanation.

"5. That he contemns authors who are of a contrary opinion, and those whom Holy Church chiefly employs.

"6. That he perniciously asserts and sets forth that, in the apprehension of geometrical matters, there is some equality between the Divine and human mind.

"7. That he had represented it to be an argument for the truth that Ptolemaics go over to the Copernicans, but not *vice versa*.

"8. That he had erroneously ascribed the tides in the ocean to the stability of the sun and the motion of the earth, which do not exist."

The special commission, however, by no means draws the conclusion from all these errors and failings, that the "Dialogues" should be prohibited, but says: "All these things

could be corrected, if it was thought that the book to which such favour should be shown were of any value."

Immediately after this follows the seventh point, saying that "the author had transgressed the mandate of the Holy Office of 1616, 'that he should relinquish the said opinion,' etc.—down to, 'and promised to obey.'" [1]

Herewith the memorial of the preliminary commission concludes. It draws no conclusions from the facts adduced, but leaves that to his Holiness the Pope. The last count confirms Galileo's chief offence: he is guilty of having disobeyed a special mandate of the ecclesiastical authorities, has broken a solemn promise made before a notary and witnesses. Such a crime, according to inquisitorial usage, demanded severe punishment. The perfidy of 1616 had signally triumphed.

[1] Vat. MS. fol. 387 ro.–389 vo.

CHAPTER V.

THE SUMMONS TO ROME.

Niccolini's Attempt to avert the Trial.—The Pope's Parable.—The Mandate summoning Galileo to Rome.—His Grief and Consternation.—His Letter to Cardinal Barberini.—Renewed Order to come to Rome.—Niccolini's fruitless Efforts to save him.—Medical Certificate that he was unfit to Travel.—Castelli's hopeful View of the Case.—Threat to bring him to Rome as a Prisoner.—The Grand Duke advises him to go.—His Powerlessness to protect his Servant.—Galileo's Mistake in leaving Venice.—Letter to Elia Diodati.

ONLY a few days later, on 15th September, the Pope informed the Tuscan ambassador through one of his secretaries, Pietro Benessi, that he (Urban) hereby notified to him, out of esteem for his Highness the Grand Duke, that he could do no less than hand Galileo's affairs over to the Inquisition. At the same time the strictest secrecy as to this information was enjoined both on the Grand Duke and Niccolini, with a threat that otherwise they would be proceeded against according to the statutes of the Holy Office.[1]

Niccolini was astounded by this news, and hastened, two days afterwards, to the Pope, to make a final attempt to avert the danger of a trial before the Inquisition for Galileo. But his urgent though respectful solicitations met with no response. Urban indeed said that "Signor Galileo was still his friend,—but that opinion had been condemned sixteen years before." He then expatiated, as he had so often done before, on the danger of the doctrine, and ended by saying that Galileo's book was in the highest degree perni-

[1] See Niccolini's despatch to Cioli of 18th September, 1632. (Op. ix. pp. 425–428.)

cious. When Niccolini remarked that he thought the "Dialogues" might be altered to the prescribed form, instead of being prohibited altogether, the Pope answered affably by telling him a parable about Cardinal Alciato. A manuscript was submitted to him with the request that, in order not to spoil the fair copy, he would mark the places requiring alteration with a little wax. The cardinal returned it without any marks at all. The author thanked him, and expressed his satisfaction that he had not found anything to find fault with, as there was not a single mark; but the cardinal replied that he had not used any wax, for if he had, he must have gone to a wax chandler's, and dipped the whole work into melted wax in order to amend it thoroughly.[1] Thus had Cardinal Alciato enlightened the unfortunate author in his day, and Urban enlightened Niccolini by quoting the story, to which he could only reply with a forced smile, that nevertheless he "hoped his Holiness would allow them to treat Galileo's work as indulgently as possible."

Niccolini's efforts had been in vain, and measures were laid with almost breathless haste to deliver Galileo up to the Inquisition. This was finally effected in the sitting of the Congregation of the Holy Office of 23rd September, 1632, when it was pronounced that he had transgressed the prohibition of 26th February, 1616, and concealed it when he obtained the *imprimatur*. In a document of the Vatican Manuscript we have the papal mandate which followed this sentence. It runs as follows :—

"23rd September, 1632. His Holiness charges the Inquisitor at Florence to inform Galileo, in the name of the Holy Office, that he is to appear as soon as possible in the course of the month of October, at Rome before the Commissary-General of the Holy Office. He must also obtain a promise from Galileo to obey this order, which the Inquisitor is to give him in the presence of a notary and witnesses, but in such a

[1] Niccolini's despatch to Cioli, 18th September, 1632. (Op. ix. pp. 425–428.)

way that Galileo may know nothing about them, so that if he refuse and do not promise to obey, they may, if necessary, bear *witness to it.*"[1]

On 1st October the Inquisitor carried out this order, which Galileo had to certify by the following attestation :—

1st October, 1632, at Florence. "I, Galileo Galilei, certify that on the day indicated the order has been delivered to me by the honourable Father Inquisitor of this city, by command of the Holy Congregation of the Holy Office at Rome, to go to Rome in the course of the present month, October, and to present myself before the Father Commissary of the Holy Office, who will inform me what I have to do. I will willingly obey the order in the course of this month October. And in testimony thereto I have written these presents."

"I, Galileo Galilei wrote *manu propria.*"[2]

This mandate to present himself before the Inquisition quite overwhelmed Galileo, as is evident from his correspondence of that period. He was totally unprepared for it. Scarcely recovered from a severe complaint in the eyes, which had lasted several months and had prevented him from using them, otherwise suffering in health, and at an advanced age, he was now to go to Rome in the midst of the plague, which had broken out again with increased virulence, and entailed strict quarantine regulations, in order to give account of himself before the dread tribunal. No wonder that it dismayed him, and in spite of his promise "willingly to obey the order in the course of this month, October," we find him making every effort to get out of it. On 6th October he wrote in the greatest excitement to Cioli, who was just then with the Grand Duke at Siena, that he was in the greatest consternation at this summons to appear before the Inquisition at Rome, and as he was well aware of the importance of the matter, he would come to Siena to lay his schemes and plans

[1] Vat. MS. p. 394 vo.

[2] After Galileo's signature follow the autograph attestations of the notary and witnesses, of whose presence Galileo knew nothing. (Vat. MS. fol. 398 ro.)

before his Highness, for he had more than one in his head, and to consult him about the steps to be taken.[1]

This journey, however, was not undertaken, as the court soon returned to Florence.

Galileo's deep depression is most evident from a long letter of 13th October addressed to a cardinal of the Barberini family,[2] which was to reach him through Niccolini. Galileo remarks first that he and his friends had foreseen that his "Dialogues" would find opponents, but he had never imagined that the envious malice of some persons would go so far as to persuade the authorities that they were not worthy to see the light. He goes on to say that the summons before the Inquisition at Rome had caused him the deepest grief, for he feared that such a proceeding, usual only in the case of serious delinquents, would turn the fruits of all his studies and labours during many years, which had lent no little repute to his name with the learned all over the world, into aspersions on his fair fame. "This vexes me so much," continues Galileo, "that it makes me curse the time devoted to these studies in which I strove and hoped to deviate somewhat from the beaten track generally pursued by learned men. I not only repent having given the world a portion of my writings, but feel inclined to suppress those still in hand, and to give them to the flames, and thus satisfy the longing desire of my enemies to whom my ideas are so inconvenient." After this desperate cry from his oppressed soul, he expresses his conviction that, burdened with seventy years and many bodily sufferings, increased by constant sleeplessness, he shall not reach the end of this tedious journey—made more arduous by unusual difficulties—alive. Impelled by the instinct of self-preservation common to all men, he ventures to ask the good

[1] Op. vii. p. 6.

[2] The address does not indicate which of the Cardinals Barberini, but it is clear from Niccolini's despatch of 13th November, 1632, to Cioli, that it was to Cardinal Antonio, jun., nephew of the Pope, and not, as Albèri assumes, to Cardinal Antonio, sen., the Pope's brother.

offices of the cardinal. He begs him to represent his pitiable condition to the wise fathers in Rome, not to release him from giving account of himself, which he is most anxious to do, as he is sure that it will only tend to his advantage, but only that it may be made easier for him to obey. There are two ways of doing this. One is for him to write a minute and conscientious vindication of all that he has said, written, or done since the day when the conflict began on Copernicus's book and his new system. He is certain that his sincerity and his pure, zealous, and devout attachment to the holy Church and its supreme head, would be so obvious from this statement, that every one, if he were free from passion and party malice, must confess that he had behaved so piously and like a good Catholic, that not even any of the fathers of the Church to whom the epithet *holy* is applied, could have shown more piety. He asserts and will indisputably prove, by all the works he has written on this subject, that he has only entered into the controversy out of zeal for the holy Church, with the intention of imparting to her servants that knowledge which one or other of them might wish to possess, and which he had acquired by long study, as it treated of subjects difficult to understand and different from the learning generally cultivated. He will also show how many opinions contained in the writings of the fathers of the Church had been an encouragement to him, and how he was "finally confirmed in his intention by hearing a short but holy and admirable address, which came unexpectedly, like an echo of the Holy Spirit, from the lips of a personage eminent in learning and revered for his sanctity of life." But for the present he will not give this admirable saying, nor the speaker's name, as it does not seem prudent or suitable to involve any one in the present affair which concerns him personally alone.[1] Having in a touching manner begged that what he should write may be read, and declared that should

[1] There is no clue whatever as to who this personage was. From what Galileo says, it must have been some high ecclesiastical dignitary.

his vindication not give satisfaction on all points he will reply in detail to objections, he proceeds to the second means of averting the journey to Rome.

He only wishes that his adversaries would be as ready to commit to paper what they have perhaps verbally and *ad aures* said against him, as he was to defend himself in writing. If they will not accept his written vindication, and still insist upon a verbal one, there was an Inquisitor, Nuncius, archbishop, and other high officials of the Church at Florence, whose summons he was quite ready to obey. He says:—"It appears to me that things of much greater importance are decided by this tribunal. And it is not likely that under the keen and watchful eyes of those who examined my book with full liberty to omit, to add, and to alter as seemed good to them, errors so weighty could escape that the authorities of this city should be incompetent to correct or punish them." This passage again clearly indicates that Galileo knew nothing whatever of the prohibition of 1616; that he had no idea of having broken his word to the ecclesiastical authorities. His only thought is of a revision of his work as the result of a conviction that it contained errors.[1]

The letter to the cardinal concludes with the following assurance:—"If neither my great age, nor my many bodily infirmities, nor the deep concern I feel, nor the wearisomeness of a journey under the present most unfavourable circumstances, are considered sufficient reasons, by this high and sacred tribunal, for granting a dispensation, or at least a delay, I will undertake the journey, esteeming obedience more than life."[2]

Niccolini could not deliver this letter to the cardinal imme-

[1] On this point also a passage in a letter of Campanella's to Galileo of 22nd October, 1632 (Op. ix. p. 303), is worth mentioning. He says: "They are doing all they possibly can here in Rome, by speaking and writing, to prove that you have acted contrary to orders."

[2] Op. vii. pp. 7–13.

diately, as he was just then absent from Rome. He received however, at the same time, an urgent petition from another quarter. Michael Angelo the younger wrote to this dignitary, with whom he was on friendly terms, and entreated him, out of consideration for the philosopher's age and infirmities, to use his powerful influence to get his affairs settled at Florence.[1] But there was a long delay before Galileo's letter was delivered to the cardinal. The ambassador wished first to consult Castelli, whom the Grand Duke had appointed as his counsel in Galileo's affairs, whether it was to be delivered. Niccolini had doubts about these explanations, and expressed them both in a letter to Galileo of 23rd October,[2] and in a despatch to Cioli of the 24th.[3] In the former Niccolini says that he thinks Galileo's letter is more calculated to incense them against him than to pacify them, and the more he asserted that he could defend his work the more it would be thought that it ought to be condemned. He thinks that a delay will be granted to the accused of his journey to Rome, but that he will not be released from it on any consideration. Niccolini gave him the following friendly hint as to the attitude he should maintain: "It appears desirable not to enter into any defence of things which the Congregation do not approve, but to submit and to recant what the cardinals may desire; for to speak as a Christian, one must not maintain anything, but what they, as the highest tribunal, that cannot err, please."[4] By such conduct the ambassador hopes for an easier solution of the question; not, however, without its coming to an actual trial, and Galileo may even be somewhat restricted in his personal liberty. He has great doubts about the passage referring to an "admirable address, which came unexpectedly like an echo of the Holy Spirit from the lips of

[1] Vat. MS. fol. 403 ro.

[2] Op. ix. pp. 304–306.

[3] Ibid. pp. 428, 429.

[4] Niccolini was mistaken if he thought that this tribunal was, according to ecclesiastical notions, infallible.

a personage eminent in learning and revered for his sanctity of life," as he thinks that if the letter is handed to the cardinal, he will hand it to the Congregation, and the cardinals may request to be informed who this personage is. At all events he would like first to consult Castelli, who was not just then at Rome.

The result of the consultation was, however, to deliver the letter to Barberini. Niccolini reported to Galileo on 6th November,[1] that he had received it in a very friendly spirit, and was altogether very kindly disposed towards him. The ambassador does not doubt that a delay will at any rate be granted, that Galileo may make the journey to Rome with less inconvenience.[2] We learn from a document in Gherardi's archives, that Galileo's petitions were discussed at a sitting of the Congregation of the Holy Office held on 11th November, in presence of the Pope, but that he would not grant them, and decreed that Galileo must obey, and ordered that the Inquisitor at Florence should be written to that he might compel Galileo to come to Rome.[3]

Niccolini, meanwhile, was unwearied in trying to get Galileo's proposals accepted. He went to Cardinal Ginetti, who was a member of the Congregation and in high favour with the Pope, and to Mgr. Boccabella, assessor of the Holy Office, and represented to both Galileo's great age, his failing health, and the peril to his life of a journey through quarantine and plague. But as both prelates, on whom as members of the Holy Office strict secrecy was imposed, "only heard what he had to say, and answered nothing," Niccolini went to the Pope himself, to make one more attempt. Having as he thought put the imperious pontiff into the best of humours, by assuring him that the unfortunate *savant* was ready to render prompt obedience to every command, he laid all the

[1] Op. ix. p. 311.

[2] See Niccolini to Cioli, 6th November. (Wolynski, "La Diplomazia," etc., p. 50.)

[3] Gherardi's Collection of Documents, Doc. vii.

circumstances before him, and used all his eloquence to awaken pity for the infirm old man. But in vain. Niccolini asked at last whether his Holiness had not seen Galileo's letter to Cardinal Barberini; and he said he had, but in spite of all that the journey to Rome could not be dispensed with. "Your Holiness incurs the danger," replied Niccolini, "considering Galileo's great age, of his being tried neither in Rome nor Florence; for I assure your Holiness that he may die on the way under all these difficulties combined with so much anxiety." "He can come very slowly (*pian piano*) in a litter, with every comfort, but he really must be tried here in person. May God forgive him for having been so deluded as to involve himself in these difficulties, from which we had relieved him when we were cardinal." This was the Pope's stern reply to the ambassador's urgent representations. And when he remarked that it was the sanction given to the book here which had occasioned all this, because from the signature, and the orders given to the Inquisitor at Florence, they felt quite secure, and had proceeded without scruple, Urban broke out into violent complaints about the conduct of Father Riccardi and Mgr. Ciampoli, and repeated that it was a question of a most pernicious doctrine.[1]

Niccolini, seeing that his efforts were in vain retired, but only to hasten to Cardinal Antonio Barberiñi, and to entreat him to take up the cause of this persecuted man. But the cardinal made the pertinent excuse that he could not act against the Pope's will, but he would procure all possible relaxation of the strict quarantine regulations for Galileo. Niccolini could not even obtain any definite promise of delay; and, much discomfited and with profound sorrow, he communicated the results of his sincere and unwearied endea-

[1] The cup of papal wrath had by this time been emptied on Ciampoli's head. He had been deprived of his important office as Secretary of the Papal Briefs, and in order to remove him from Rome he was made Governor of Montalto, and entered on his post at the end of November. (See the letters of Castelli to Galileo. Op. ix. pp. 306, 313-316.)

vours in a letter to Galileo of 13th November, 1632, and a despatch to Cioli of the same date.[1]

A few days after the receipt of this bad news, on 19th November, Galileo was summoned before the Inquisitor at Florence for the second time, in accordance with the papal mandate of 11th November. He sent the following report of it on 20th November, to Rome:—

"I have again summoned Galileo Galilei, who said that he was perfectly willing to go to Rome, and only hesitated on account of his advanced age, his evident ill health, the circumstance that he was under medical treatment, and many other things. I then charged him to comply with the order to go to Rome, and in presence of a notary and two witnesses gave him a respite of one month. He again appeared quite willing, but I do not know whether he will go. I told him what I had received."[2]

On 9th December the papal orders were issued to the Inquisitor at Florence, as soon as the month had elapsed, to *compel* Galileo to set out for Rome.[3] Niccolini wrote to Cioli on the 11th[4] and to Galileo on the 12th[5] December, that he had again tried to procure a longer respite, but had found it impossible. He moreover strongly advised Galileo to set out as soon as possible, and stay for at least twenty days' quarantine somewhere within the territory of Siena, as this prompt obedience would be greatly to his advantage at Rome.

But the time appointed had nearly elapsed, and Galileo made no preparations for starting. Shortly before it terminated, in accordance with his instructions, the Inquisitor at Florence sent his vicar to him. On 18th December the Inquisitor sent the following report to Rome:—

"My vicar found Galileo Galilei in bed. He told him he was quite willing to come, but in these times he had no heart for it; besides, just

[1] For these documents, from which the above narrative is taken, see Op. ix. pp. 312, 313 and 429, 430.

[2] Vat. MS. fol. 401 ro.

[3] Gherardi's Documents, and Vat. MS. fol. 402 vo.

[4] Op. ix. pp. 430, 431.

[5] Ibid. pp. 318, 319.

now, owing to having been attacked by sudden illness, he was not in a condition to set out. He has sent me the enclosed medical certificate. So that I have not failed to do my duty."[1]

The medical certificate, dated 17th December, gives a clear idea of the physical condition of this much-tried man, and we therefore give it in full. It is signed by the doctors Vettorio de Rossi, Giovanni Ronconi, and Pietro Cervieri, and is as follows:—

"We, the undersigned physicians, certify that we have examined Signor Galileo Galilei, and find that his pulse intermits every three or four beats, from which we conclude that his vital powers are affected, and at his great age much weakened. To the above are to be ascribed frequent attacks of giddiness, hypochondriacal melancholy, weakness of the stomach, sleeplessness, and flying pains about the body, to which others also can testify. We have also observed a serious hernia with rupture of the peritoneum. All these symptoms are worthy of notice, as under the least aggravation they might evidently become dangerous to life."[2]

But much importance does not seem to have been attached to this certificate at Rome; and in a despatch of 26th December, Niccolini expressed his fears to Cioli lest the ecclesiastical authorities at Florence should receive extreme orders.[3] Castelli also, in a letter of 25th December, urged his old master to set out.[4] But in this, as in all his letters of this period, he shows that he had no idea of the real moment to Galileo of the proceedings going on at Rome, and he was altogether ill informed about the course things were taking.[5] Probably great reserve was maintained towards this faithful adherent of Galileo, who was also to be his advocate. Castelli always consoled him with the assurance that, to the best of his belief, the final decision of the holy tribunal would never be against him.[6] Even in his letter of 25th December, Castelli says that

[1] Vat. MS. fol. 406 ro.

[2] Ibid. pp. 407 ro.

[3] Op. ix. p. 431.

[4] Ibid. pp. 319, 320.

[5] See Castelli's Letters to Galileo of 2nd and 16th Oct., 1632. (Op. ix. pp. 295–298, and 299–301.)

[6] See his letters. (Op. ix. pp. 306, 307, and 313–315.)

he only considers it necessary for Galileo to set out for Rome, because he entertained a singular notion that Galileo's cunning persecutors desired nothing more than that he should not come to Rome, in order that they might decry him as an obstinate rebel; for he had not committed any crime against the Holy Office! It is plain that the worthy Father Castelli was not very sharp-sighted, as he had abundantly proved before by giving up the original of the celebrated letter of Galileo's to him of 21st December, 1613.

On 30th December, the fears mentioned by Niccolini in his despatch of 26th December were realised. On that day a papal mandate was issued to the Inquisitor of Florence, which said that neither his Holiness nor the Holy Congregation could or would tolerate such evasions; it must therefore be proved whether Galileo's state was really such that he could not come to Rome without danger to his life. His Holiness and the Holy Congregation would therefore send a commissioner, with a physician, to Florence, who would visit Galileo and make a true and trustworthy report on his condition, and if he were in a state to travel, bring him a prisoner in irons to Rome (*carceratum et ligatum cum ferris*). If, out of consideration for his health, or other danger to life, his coming must be postponed, as soon as he had recovered and the danger was over, he was to be brought a prisoner in irons to Rome. The document concluded with the remark that the papal commissioner and the physician would travel at Galileo's expense, because he had not obeyed the command to appear at Rome when his condition would have permitted it.[1]

[1] "30th Dec. 1632, a Nativitate. Sanctissimus mandavit Inquisitori rescribi quod Sanctitas Sua et Sacra Congregatio nullatenus potest et debet tolerare hujusmodi subterfugia et ad effectum verificandi an revera in statu tali reperiatur quod non possit ad urbem absque vitae periculo accedere. Sanctissimus et Sacra Congregatio transmittet illuc commissarium una cum medicum qui illum visitent ut certam et sinceram relationem faciant de statu in quo reperitur, et si erit in statu tali ut venire possit illum carceratum et ligatum cum ferris transmittat. Si vero causa sanitatas et ob periculum vitae transmissio erit differenda, statim postquam

To avert these extreme measures from being actually carried out, the Grand Duke told Cioli to write to Galileo on 11th January, 1633, that he (Ferdinand) took a sincere interest in the affair, and regretted that he was unable to spare him the journey, but it was at last necessary that he should obey the supreme authorities In order that he might perform the journey more comfortably, he would place one of the grand ducal litters and a trustworthy guide at his disposal, and would also permit him to stay at the house of the ambassador, Niccolini, supposing that he would, within a month, be released from Rome.[1]

The pitiful impotence of an Italian ruler of that day in face of the Roman hierarchy is obvious in this letter. His sovereign does not dare to protect the philosopher—the greatest of whom Italy can boast—from papal persecution, but was obliged to give him up to the dreaded Inquisition. It must not, however, be supposed that the young Ferdinand, then only twenty-two, because he had been brought up in the strictest Romish fashion by the two Grand Duchesses and Cioli, acted otherwise than any other Italian ruler would have done in the like situation. Not one of them would have had courage, nor have been independent enough of Rome, to put an energetic veto on a papal mandate like this. The Venetian Republic, in which it had been established as an axiom by Paolo Sarpi that "the power of rulers is derived immediately from God, and spiritual as well as temporal things are subject to it," was the only State of Italy which would have asserted its sovereignty and would never have delivered up one of its

convaluerit et cessante periculo carceratus et ligatus ac cum ferris transmittat. Commissiarius autem et medici transmittantur ejus sumptibus et expensis quid se in tali statu et temporibus constituit et tempore oportuno ut ei fuerat preceptum venire et facere contempsit." (Gherardi's Documents, Doc. x.; and Vat. MS. fol. 409 vo.)

[1] Op. ix. pp. 322, 323. This last observation of the Grand Duke's, only meaning that he reckoned on a speedy release for Galileo, afterwards gave Cioli occasion, as we shall see by-and-by, for a most mean act towards Galileo.

officials to the Roman will. Galileo now suffered a bitter penalty for his former thankless conduct to the Free State. The grand ducal orders had to be unconditionally obeyed; and as any further delay might entail the worst consequences, Galileo fixed 20th January for his departure.[1]

Before setting out, however, on the 15th of the month, he addressed a long letter to the celebrated jurist and advocate in the parliament of Paris, Elia Diodati (not to be confounded with Johannes Diodati, the translator of the Bible), who corresponded with the most learned men of the time, and took a lively interest in Galileo's studies and fate. Some parts of this letter show how well this strictly theistic, or more properly, Roman Catholic *savant*, knew how to bring the modern astronomy into agreement with Christian philosophy and the Bible, and this from real conviction, for this letter to his friend at Paris was quite private. From this we may conclude that even his celebrated demonstrations to Father Castelli, of 21st December, 1613, and the still more elaborate ones to the Grand Duchess Christine, 1615, were the result of honest conviction, and were not, as his enemies maintained, mere dialectic fencing, intended to bring Scripture and the Copernican theory into agreement. We give these interesting passages of the letter as well as those which refer to Galileo's unhappy situation :—

"I am sorry that the two books of Morin[2] and Fromond[3] did not reach

[1] It is incomprehensible how many of Galileo's biographers, even Parchappe (p. 216) and H. Martin (p. 120), who had Albèri's work at command, fix the 15th as the date. And yet we have a letter of Galileo's to the Cardinal de Medici of the 15th Jan. (Op. vii. pp. 15, 16), asking if he had any commissions, in which he expressly mentions "the 20th instant" as the day of his departure.

[2] "Famosi et antiqui problematis de telluris motu vel quiete hactenus optata solutio: ad Em. Card. Richelium Ducem et Franciæ Parem. A. Jo. Bapt. Morino apud Gallos et Bellajocensibus Francopolitano Doct. Med. atque Paris. Mathematum professore. Terra stat in æternum; Sol oritur et occidit. Eccles. Cap. I. Parisiis apud tuctorem juxta Pontem novum 1631, in 4o."

[3] Liberti Fromondi in Acad. Lovaniensi S. Theolog. Doctoris et Pro-

me till six months after the publication of my 'Dialogues,' because otherwise I should have had an opportunity of saying much in praise of both, and of giving some consideration to a few particular points, especially to one in Morin and to another in Fromond. I am quite astonished that Morin should attach so great a value to astrology, and that he should pretend to be able, with his conjectures (which seem to me very uncertain) to establish its truth. It will really be a wonderful thing, if, as he promises, he raises astrology by his acuteness to the first rank among human sciences, and I await such a startling novelty with great curiosity. As to Fromond, who proves himself to be a man of much mind, I could have wished not to see him fall into, in my opinion, a grave though wide-spread error; namely, in order to refute the opinions of Copernicus, he first hurls scornful jests at his followers, and then (which seems to me still more unsuitable), fortifies himself by the authority of Holy Scripture, and at length goes so far as to call those views on these grounds nothing less than heretical. That such a proceeding is not praiseworthy seems to me to admit of very easy proof. For if I were to ask Fromond, who made the sun, the moon, the earth, and the stars, and ordained their order and motions, I believe he would answer, they are the creations of God. If asked who inspired Holy Scripture, I know he would answer, the Holy Spirit, which means God likewise. The world is therefore the work and the Scriptures are the word of the same God. If asked further, whether the Holy Spirit never uses words which appear to be contrary to things as they really are, and are only so used to accommodate them to the understandings of rude, uncultivated people, I am convinced that he would reply, in agreement with the holy fathers, that such is the usage of Scripture, which, in a hundred passages, says things for the above reason, that if taken literally, are not only heresies, but blasphemies, since they impute to God, anger, repentance, forgetfulness, etc. But if I were to ask Fromond, whether God, in order to accommodate Himself to the understanding of the multitude, ever alters His creations, or whether nature, which is God's handmaid, and is not changeable at man's desire, has not always observed, and does not still maintain, her usual course in respect to motion, form, and relative positions of the various parts of the universe —I am certain that he would answer, the moon has always been spherical, although for a long period the people thought she was flat; he would say, in fine, that nothing ever changes in nature to accommodate itself to the comprehension or notions of men. But if it be so, why, in our search for knowledge of the various parts of the universe, should we begin rather with the words than with the works of God? Is the work less noble or less excellent than the word? If Fromond, or any one else, had settled

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fessoris ordinarii. Ant.-Aristarchus, sive orbis terræ immobilis. Liber unicus, in quo decretum S. Congreg. S. R. E. Cardinalium anno 1616, adversus Pythagorico-Copernicanos editum defenditur. Antverpiæ ex officina Plantiniana 1631, in 4o."

that the opinion that the earth moves is a heresy, and if afterwards. demonstration, observation, and necessary concatenation should prove that it does move, into what embarrassment he would have brought himself and the holy Church. But if, on the contrary, the works are indisputably proved to vary from the literal meaning of the words, and we give the Scriptures the second place, no detriment to Scripture results from this. Since, in order to accommodate themselves they often ascribe, even to God Himself, entirely false conditions, why should we suppose that in speaking of the earth or the sun they should keep to such strict laws, as not to attribute conditions to these creations, out of regard for the ignorance of the masses, which are opposed to fact? If it be true that the earth moves and the sun stands still, it is no detriment to Holy Scripture, since it speaks of things as they appear to the people.

"Many years ago, when the stir about Copernicus was beginning, I wrote a letter[1] of some length, in which, supported by the authorities of numerous fathers of the Church, I showed what an abuse it was to appeal so much to Holy Scripture in questions of natural science, and I proposed that in future it should not be brought into them. As soon as I am in less trouble, I will send you a copy. I say, in less trouble, because I am just now going to Rome, whither I have been summoned by the Holy Office, which has already prohibited the circulation of my 'Dialogues.' I hear from well-informed parties that the Jesuit fathers have insinuated in the highest quarters that my book is more execrable and injurious to the Church than the writings of Luther and Calvin. And all this although, in order to obtain the *imprimatur*, I went in person to Rome, and submitted the manuscript to the Master of the Palace, who looked through it most carefully, altering, adding, and omitting, and even after he had given it the *imprimatur*, ordered that it should be examined again at Florence. The reviser here, finding nothing else to alter, in order to show that he had gone through it carefully, contented himself with substituting some words for others, as, for instance, in several places, 'Universum' for 'Nature,' 'quality' for 'attribute,' 'sublime spirit' for 'divine spirit,' excusing himself to me for it by saying that he foresaw that I should have to do with fierce foes and bitter persecutors, as has *indeed come to pass*."[2]

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[1] The letter to the Grand Duchess Christine.

[2] Op. vii. pp. 16–20.

CHAPTER VI.

GALILEO'S ARRIVAL AT ROME.

Galileo reaches Rome in February, 1632.—Goes to the Tuscan Embassy.—No Notice at first taken of his Coming.—Visits of Serristori.—Galileo's Hopefulness.—His Letter to Bocchineri.—Niccolini's Audience of the Pope.—Efforts of the Grand Duke and Niccolini on Galileo's behalf.—Notice that he must appear before the Holy Office.—His Dejection at the News.—Niccolini's Advice not to defend himself.

ON 20th January this palsied old man set out, borne in a litter, on his arduous journey to Rome.[1] Near Ponte a Centino, on the frontiers of the States of the Church, in the unhealthy flats of the vale of Paglia, he had to submit to a long quarantine, which, in spite of Niccolini's repeated efforts, had only been shortened two days.[2] He could not resume his journey for twenty days, but arrived at length, on 13th February, at Rome, in good preservation, and alighted at the hotel of the Tuscan Embassy, where he was most kindly received by Niccolini. On the next day Niccolini informed Cioli that "Signor Galilei arrived yesterday evening in good health at this house." He mentioned further that Galileo had already called on Mgr. Boccabella, not as an official personage, as he had resigned his office of assessor to the Holy Office a fortnight ago, but as a friend who showed great interest in his fate, and to take his advice as to the conduct to be observed. Galileo had already introduced himself to the new assessor. Niccolini concluded his despatch by saying that to-morrow, in the course of the forenoon, he

[1] The Inquisitor informed the Holy Office, two days later, that Galileo had left Florence on the 20th. (Vat. MS. fol. 411 ro.; and Gherardi's Documents, Doc. xii.)

[2] Comp. Niccolini's letter to Galileo of 5th Feb., 1633. (Op. ix. p. 327.)

would introduce Galileo to Cardinal Barberini, and ask him for his kind mediation with his Holiness, and beg him, in consideration of Galileo's age, his reputation, and his ready obedience, to allow him to remain at the hotel of the embassy, and not to be taken to the Holy Office.[1]

This request was tacitly granted for the time being, and afterwards officially confirmed. To Galileo's great surprise, no notice was taken of his presence at Rome for some time. Cardinal Barberini gave him a friendly hint, not at all *ex officio*, that he had better keep very retired in the ambassador's house, not receive any one, nor be seen out of doors, as any other conduct might very likely be to his disadvantage.[2] Of course the *savant*, anxious as he was, scrupulously obeyed the admonition, and awaited the event in quiet retirement, though with great impatience. Not the smallest instruction was issued by the Holy Office; to all appearance it did not in the least concern itself about the arrival of the accused which it had urged so strenuously. But it was appearance only. For only two days after he came, Mgr. Serristori, counsellor to the Holy Office (the same to whom a year before Count Magalotti had, by Galileo's wish, presented one of the eight copies of the "Dialogues" brought to Rome), called several times on Galileo, but always said expressly that his visits were entirely of a private character and originated with himself. But as he always discussed Galileo's cause very particularly, there is good reason to think that he was acting under orders from the Holy Office, who wanted to discover the present sentiments and defensive arguments of the dreaded dialectician, that they might act accordingly at the trial,—a measure entirely in accordance with the traditional practice of the Holy Office. Niccolini put this construction on the Monsignore's visits,[3] but not so Galileo. For

[1] Niccolini's despatch to Cioli of 14th Feb. (Op. ix. p. 432.)

[2] See Niccolini' despatches to Cioli of 16th and 19th Feb. (Op. ix. pp. 432, 433.)

[3] See Niccolini's despatch to Cioli of 19th Feb.

although he perceived that in all probability they were "approved or suggested by the Holy Congregation," he was far from thinking any evil, and was delighted that this officer of the Inquisition, his "old friend and patron," should "cleverly give him an opportunity of saying something by way of expressing and confirming his sincere devotedness to the holy Church and her ministers," and that he apparently listened to it all with great approval.[1] He thinks this course pursued by the Inquisition "may be taken to indicate the beginning of mild and kindly treatment, very different from the threatened cords, chains, and dungeons;"[2] indeed, while he assumes that these conferences are held at the instigation of the authorities, "and for the purpose of gaining some general information," he thankfully acknowledges "that in this case they could not proceed in any way more favourable to him or less likely to make a sensation."[3] However, in the sequel he was to discover soon enough, that they cared nothing whatever about making a sensation at Rome, and that even in this respect they did not spare him in the least.

At this period, as his letters show, Galileo was very hopeful. On 19th February he wrote to Cioli, that to all appearance the threatened storm had passed, so that he did not allow his courage to sink as if shipwreck were inevitable, and there were no hope of reaching the haven; and the more so as, obedient to his instructor, in the midst of stormy billows he—

"Was taking his course with modest sail set."[4]

This instructor was Niccolini, who strongly advised Galileo "to be always ready to obey and to submit to whatever was ordered, for this was the only way to allay the irritation of one who was so incensed, and who treated this affair as a

[1] See Galileo's letter to Cioli of 19th Feb. (Op. vii. pp. 20–22.)
[2] Ibid.
[3] Comp. Galileo's letter to Geri Bocchineri of 25th Feb. (Op. vii. p. 23.)
[4] Op. vii. pp. 20–22.

personal one."[1] It is clear that by this personal persecutor no other than Urban VIII. can be intended.

The same cheerful confidence is expressed in a letter of Galileo's of 25th February to Geri Bocchineri. One passage in it deserves special attention. It is as follows:—

"We" (Niccolini and Galileo) "hear at last that the many and serious accusations are reduced to one, and that the rest have been allowed to drop. Of this one I shall have no difficulty in getting rid when the grounds of my defence have been heard, which are meanwhile being gradually brought, in the best way that circumstances allow, to the knowledge of some of the higher officials, for these are not at liberty to listen freely to intercession, and still less to open their lips in reply. So that in the end a favourable issue may be hoped for."[2]

A despatch of Niccolini's to Cioli of two days later explains the nature of this chief accusation:—

"Although I am unable to say precisely what stage Galileo's affair has reached, or what may happen next, as far as I can learn the main difficulty consists in this—that these gentlemen maintain that in 1616 he was ordered neither to discuss the question nor to converse about it. He says, on the contrary, that those were not the terms of the injunction, which were that *that doctrine was not to be held nor defended.* He considers that he has the means of justifying himself, because it does not at all appear from his book that he does hold or defend the doctrine, nor that he regards it as a settled question, as he merely adduces the reasons *hinc hinde.* The other points appear to be of less importance and easier to get over."[3]

It is in the highest degree significant that Galileo—as is evident from Niccolini's report above—from the first decidedly denies ever having received an injunction not to discuss the Copernican theory *in any way;* all that he knows is that it is not to be held nor defended; that is, *all that he knows fully agrees with the note of 25th February,* 1616; *and with the decree of the Congregation of 5th March,* 1616. Accordingly he does not consider that he has gone beyond the orders of

[1] See Niccolini's despatch to Cioli of 19th Feb.
[2] Op. vii: p. 22.
[3] Op. ix. 434.

the authorities, and thinks that he can prove it even from the book itself.

On 27th February the Tuscan ambassador had a long audience of the Pope, officially announced Galileo's arrival at Rome, and expressed the hope that as he had shown his readiness to submit to the papal judgment and the enlightened opinion of the Congregation, the Pope would now be convinced of his devout reverence for spiritual things, especially in reference to the matter in hand. The Pope found it convenient not to take any notice of this indirect question, and replied that he had shown Galileo a special and unusual favour in allowing him to stay at Niccolini's house instead of in the buildings of the Holy Office; and he had only done so because he was a distinguished official of the Grand Duke's, and it was out of respect for his Highness that he had granted this exceptional favour to his subject. In order to enhance its value, Urban also told the ambassador that even a noble of the house of Gonzaga, a relative of Ferdinand's, had not only been placed in a litter and brought under escort to Rome by command of the Holy Office, but had been taken at once to the Castle and kept there for a long time, until the trial was ended. Niccolini hastened to acknowledge the greatness of the favour, expressed his warmest thanks for it, and ventured to plead that in consideration of Galileo's age and infirm health the Pope would order that the trial should come on soon, so that he might return home as soon as possible. Urban replied that the proceedings of the Holy Office were generally rather tedious, and he really did not know whether so speedy a termination could be looked for, as they were still engaged with the preliminaries of the trial. Urban had by this time become warm, and went off into complaints of Ciampoli and the rest of his evil counsellors; he also remarked that although Galileo had expressly stated in his "Dialogues" that he would only discuss the question of the double motion of the earth hypothetically, he had, in adducing the arguments for it, spoken of it as settled, and

as if he agreed with it. In conclusion the Pope said: *Moreover, Galileo had acted contrary to the injunction given him in 1616 by Cardinal Bellarmine in the name of the Holy Congregation.* Niccolini mentioned in defence of Galileo all that he had told him about this accusation, but the Pope adhered obstinately to his opinion. The ambassador came away from this audience with the scant consolation that, at all events, Urban's personal embitterment against Galileo was a little appeased.[1] We may remark here that what the Pope said about the proceeding of 26th February, 1616, is just as inaccurate as Riccardi's communication to Niccolini was at that time.[2]

Both Niccolini and the Grand Duke were unwearied in their good offices for Galileo. The former urgently commended his case to Cardinal Antonio Barberini, senr., who said he was exceedingly well disposed to Galileo, and regarded him as a very eminent man; but added that it was a dangerous question, which might easily introduce some fantastic religious doctrines into the world, and especially at Florence, where men's wits were so subtle and over curious.[3] The Grand Duke, at Galileo's request, sent letters of introduction to the Cardinals Scaglia and Bentivoglio (the well-known statesman and historian), who, as Niccolini had learnt, were members of the Congregation.[4] Ferdinand also thanked the Pope, in an official letter through Cioli to Niccolini, for the favour of allowing Galileo to stay at the embassy, ending with a request that the business might be concluded as soon as possible.[5]

When Niccolini delivered this message to Urban on 13th March, he told him that it would be absolutely necessary to summon Galileo to the Holy Office as soon as the trial came

[1] In the account of this conversation we have followed Niccolini's despatch to Cioli of 27th Feb. (Op. ix. pp. 434–436.)

[2] Comp. pp. 171, 172.

[3] Op. ix. pp. 434–436.

[4] Ibid. pp. 330–332.

[5] Op. vii. p. 27; and ix. p. 436; also Wolynski, "La Diplomazia," etc., p. 57.

on, because it was the usage and it could not be departed from. Niccolini again urged Galileo's health, his age, and willingness to submit to any penalties; but Urban replied, "It would not do to act otherwise. May God forgive Galileo for having intruded into these matters concerning new doctrines and Holy Scripture, when it is best to keep to universally recognised opinions. May God help Ciampoli, also, about these new notions, as he seemed to have a leaning towards them, and to be inclined to the modern philosophy." The Pope then expressed his regret at having to "subject Galileo, who had been his friend, with whom he had often held confidential intercourse, and eaten at the same table, to these annoyances; but it was in the interests of religion and faith." Niccolini remarked, that when Galileo was heard he would be able, without difficulty, to give satisfactory explanations of everything; to which Urban replied: "He would be heard when the time came; but there was one argument which had never been answered, namely, that God was omnipotent, and therefore everything was possible to Him; but if so, why should we impose any necessity upon Him?" This was, as we know, the argument brought forward by Urban in his intimate conversation with Galileo in 1624, and which at the end of the "Dialogues" he had put into the mouth of Simplicius as originating "with a very exalted and learned personage." Niccolini prudently replied that he did not understand these matters, but he had heard it said of Galileo that he did not hold the doctrine of the earth's double motion as true, but said that it could not be denied that as God could have created the world in a thousand ways, He could have created it in this way. Urban replied with some irritation: "It is not for man to impose necessity upon God." Niccolini, who saw that the Pope was getting angry, tried to pacify him by saying that Galileo was here on purpose to obey and to recant everything which could be injurious to religion. He then adroitly turned the subject, and returned to the request that his Holiness would have

compassion on Galileo, and allow him to remain at the embassy. Urban merely replied that he would have special apartments assigned to Galileo, the best and most comfortable in the Holy Office. With this Niccolini had to be content.

In concluding the despatch of 13th March to Cioli, in which he reported this interview, he says:—[1]

"When I returned home I told Galileo in part the conversation with his Holiness, but not for the present, that it was intended to summon him to the Holy Office, because I am convinced that this news would cause him the deepest concern, and he would be in the greatest anxiety till the time came. I have thought all the more that it was best to act thus, as no further particulars are as yet known about his citation; for the Pope told me in reference to the speedy settlement of the business, that he did not know what hope there was of it, but that all that was possible would be done."

Meanwhile, Ferdinand II., in spite of the increasingly unpromising aspect of affairs, continued indefatigably to sustain his ambassador's efforts. The latter and Galileo, in two letters of 19th March,[2] asked the Grand Duke to send letters of recommendation to the eight other cardinals who composed the Holy Congregation, like those he had sent to their eminences Bentivoglio and Scaglia, lest they should feel themselves slighted, and the Grand Duke readily granted the request.[3] The prelates, however, received these letters with mixed feelings, and excused themselves from answering them, as it was forbidden them in their capacity as members of the Holy Office; some even hesitated to receive the letters at all, and it was not till Niccolini pointed out that Cardinal Barberini and others had received them, that they consented to do so.[4] These letters had evidently produced the happiest

[1] Op. ix. pp. 436–438.

[2] Op. ix. p. 438; and vii. p. 228.

[3] See Geri Bocchineri's Letters to Galileo and Cioli, both of 26th March, 1633: the former, Wolynski, "Lettere inedite," etc., p. 89; the latter, Op. ix. p. 336.

[4] Op. ix. p. 441.

effect with the Cardinals Scaglia and Bentivoglio. They united, as Niccolini reported on the 19th to Cioli, in protecting Galileo. Scaglia even read the celebrated "Dialogues," and, which was more to the purpose, that he might, with the help of Castelli,[1] who was best qualified to do it, explain the offending passages in a conciliatory spirit.

All this time Galileo, as is evident from his letters, was entertaining the most confident hopes of the favourable issue of his cause, and the final triumph of truth over falsehood.[2] Neither he nor his indefatigable friends, Niccolini and Castelli, could, it is true, learn anything definite about the actual state of the trial. The members of the Congregation, who alone could have given any information, kept the secrets of the Inquisition very close, as indeed they were bound to do under the heaviest penalties. The month of March passed by before the Holy Tribunal opened any direct official intercourse with Galileo. April was now come, and with it the storm which had been so long gathering burst over his head.

On the 7th, Niccolini went to Cardinal Barberini by his desire, and was informed on behalf of the Pope and the Congregation, that, in order to decide Galileo's cause, they could not avoid citing him to appear before the Holy Office, and as it was not known whether it could be all settled in the course of two hours, perhaps it would be necessary to detain him there. Barberini continued that "out of respect for the house in which Galileo had been staying, and for Niccolini as grand ducal ambassador, and in consideration of the good understanding which had always existed between his Highness and the papal chair, especially in matters relating to the Inquisition, they had not failed to inform him (Niccolini) of this beforehand, not to be wanting in respect for a prince so zealous for religion." After Niccolini had warmly thanked the cardinal for the attention shown by the Pope and the

[1] Op. ix. p. 338.

[2] See Galileo's letters to G. Bocchineri of 5th and 12th, and to Cioli of 12th and 19th March. (Op. vii. pp. 24–28.)

Congregation to the Grand Duke, and to himself as his ambassador, he pleaded Galileo's age and health,—he had again been suffering severely from a fresh attack of the gout,—and finally the deep grief he would feel, and earnestly begged that his eminence would consider whether it would not be possible to permit him to return every evening to sleep at the embassy. As to secrecy, the strictest silence might be enjoined on him under threat of the severest penalties. But the prelate was not of opinion that such a permission was to be expected; he proffered, however, every comfort for Galileo that could be desired, and said that he would neither, as was customary with accused persons, be treated as a prisoner, nor be placed in a secret prison; he would have good rooms, and perhaps even the doors would not be locked.

Niccolini reported this notification to Cioli on 9th April,[1] and added the following interesting information:—

"This morning I also conversed with his Holiness on the subject, after having expressed my thanks for the communication made to me; the Pope again gave vent to his displeasure that Galileo should have discussed this subject, which appears to him to be very serious, and of great moment to religion. Signor Galileo thinks, nevertheless, that he can defend his statements on good grounds; but I have warned him to refrain from doing so, in order not to prolong the proceedings, and to submit to what shall be prescribed to him to believe respecting the motion of the earth. He has fallen into the deepest dejection, and since yesterday has sunk so low that I am in great concern for his life."

From this, then, we learn that up to 8th April Galileo was still intending to defend his opinions before the Holy Tribunal; and that it was only on the urgent expostulation of the ambassador, whom he knew to be his sincere friend, that he gave up all idea of opposition, and resolved upon entire and passive submission. How hard it was for him to yield is evident from the concluding sentence of Niccolini's despatch.

[1] Op. ix. pp. 438, 439.

CHAPTER VII.

THE TRIAL BEFORE THE INQUISITION.

The First Hearing.—Galileo's submissive Attitude.—The Events of February, 1616.—Galileo denies Knowledge of a Special Prohibition.—Produces Bellarmine's Certificate.—Either the Prohibition was not issued, or Galileo's Ignorance was feigned.—His Conduct since 1616 agrees with its non-issue.—The Inquisitor assumes that it was issued.—Opinions of Oregius, Inchofer, and Pasqualigus.—Galileo has Apartments in the Palace of the Holy Office assigned to him.—Falls ill.—Letter to Geri Boccbineri.—Change of Tone at second Hearing hitherto an Enigma.—Now explained by Letter from Firenzuola to Cardinal Fr. Barberini.—Galileo's Confession.—His Weakness and Subserviency.

ON 12th April Galileo appeared in great distress of mind, for his first hearing in the Palace of the Inquisition, before the Commissary-General of the Holy Office, Father Vincenzo Maccolani da Firenzuola, and the fiscal attorney of the Holy Tribunal, Father Carlo Sincero. In all his answers to the Inquisitor, he is actuated by one idea—that of shortening the proceedings and averting a severe sentence by submissive acquiescence. This resigned attitude must be borne in mind in order to form a correct judgment of his depositions before the dread tribunal.[1]

According to the rules of the Inquisition, an oath is administered to the accused that he will speak the truth, and he is then asked whether he knows or conjectures the reason of his citation. Galileo replied that he supposed he had been summoned to give an account of his last book. He was then asked whether he acknowledged the work shown him, "Dialogo di Galileo Galilei, Linceo," which treats of the two systems of the world, as entirely his own; to which he

[1] Vat. MS. fol. 413 vo. 419 ro.

replied after a close examination of the copy, that he acknowledged all that it contained to have been written by himself. They then passed to the events of 1616. The Inquisitor wishes to know whether Galileo was at that time in Rome, and for what reason. He deposed that he certainly came to Rome in that year, and because he had heard that scruples were entertained about the Copernican opinions, and he wished to know what opinion it was proper to hold in this matter, in order to be sure of not holding any but holy and Catholic views. This deposition seems to be a misrepresentation of the real state of the case; for we know that he went to Rome with a two-fold purpose in 1616: on the one hand, to frustate the intrigues of his enemies, Fathers Lorini, Caccini, and their coadjutors; and on the other, to avert the threatened prohibition of the Copernican doctrines by his scientific demonstrations. The motive of his journey to Rome is not in any way altered by the fact that he did not succeed in his object, and that he then submitted to the admonition of Cardinal Bellarmine of 26th February, and to the decree of 5th March.

The Inquisitor asked whether he came at that time to Rome of his own accord, or in consequence of a summons. "*In the year* 1616 *I came of my own accord to Rome, without being summoned,*" was the decided answer. The conferences were then spoken of, which Galileo had at that time with several cardinals of the Holy Office. He explained that these conferences took place by desire of those prelates, in order that he might instruct them about Copernicus's book, which was difficult for laymen to understand, as they specially desired to acquaint themselves with the system of the universe according to the Copernican hypothesis. The Inquisitor then asked what conclusion was arrived at on the subject.

Galileo: "Respecting the controversy which had arisen on the aforesaid opinion that the sun is stationary, and the earth moves, it was decided by the Holy Congregation of the Index, that such an opinion,

considered as an established fact, contradicted Holy Scripture, and was only admissible as a conjecture (*ex suppositione*), as it was held by Copernicus."[1]

Inquisitor: "Was this decision then communicated to you, and by whom?"

Galileo: "This decision of the Holy Congregation of the Index was made known to me by Cardinal Bellarmine."

Inquisitor: "You must state what his Eminence Cardinal Bellarmine told you about the aforesaid decision, and whether he said anything else on the subject, and what?"

Galileo: "Signor Cardinal Bellarmine signified to me that the aforesaid opinion of Copernicus might be held as a conjecture, as it had been held by Copernicus, and his eminence was aware that, like Copernicus, I only held that opinion as a conjecture, which is evident from an answer of the same Signor Cardinal to a letter of Father Paolo Antonio Foscarini, provincial of the Carmelites, of which I have a copy, and in which these words occur: 'It appears to me that your reverence and Signor Galileo act wisely in contenting yourselves with speaking *ex suppositione*, and not with certainty.' This letter of the cardinal's is dated 12th April, 1615.[2] It means, in other words, that that opinion, taken absolutely, must not be either held or defended."

Galileo was now requested to state what was decreed in February, 1616, and communicated to him.

Galileo: "In the month of February, 1616, Signor Cardinal Bellarmine told me that as the opinion of Copernicus, if adopted absolutely, was contrary to Holy Scripture, it must neither be held nor defended, but that it might be held hypothetically, and written about in this sense. In accordance with this I possess a certificate of the said Signor Cardinal Bellarmine, given on 26th May, 1616, in which he says that the Copernican opinion may neither be held nor defended, as it is opposed to Holy Scripture, of which certificate I herewith submit a copy."[3]

Inquisitor: "When the above communication was made to you, were any other persons present, and who?"

Galileo: "When Signor Cardinal Bellarmine made known to me what I have reported about the Copernican views, some Dominican

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[1] We have before stated that Copernicus did not at all consider his doctrine a hypothesis, but was convinced of its actual truth. It was Osiander's politic introduction which had given rise to the error which was then generally held.

[2] Prof. Berti has first published this interesting letter in full in his "Copernico e le vicende Sistema Copernicano in Italia," pp. 121–125.

[3] Vat. MS. fol. 423 ro.

fathers were present, but I did not know them, and have never seen them since."

Inquisitor: "Was any other command communicated to you on this subject, in the presence of those fathers, by them or any one else, and what?"

Galileo: "I remember that the transaction took place as follows: Signor Cardinal Bellarmine sent for me one morning, and told me certain particulars which I was to bring to the ears of his Holiness before I communicated them to others.[1] But the end of it was that he told me that the Copernican opinion, being contradictory to Holy Scripture, must not be held nor defended. It has escaped my memory whether those Dominican fathers were present before, or whether they came afterwards; neither do I remember whether they were present when the Signor Cardinal told me the said opinion was not to be held. It may be that a command was issued to me that I should not hold nor defend the opinion in question, but I do not remember it, for it is several years ago."

Inquisitor: "If what was then said and enjoined upon you as a command were read aloud to you, would you remember it?"

Galileo: "I do not remember that anything else was said or enjoined upon me, nor do I know that I should remember what was said to me, even if it were read to me. I say freely what I do remember, because I do not think that I have in any way disobeyed the injunction, that is, have not by any means held nor defended the said opinion that the earth moves and the sun is stationary."

The Inquisitor now tells Galileo that the command which was issued to him before witnesses contained: "that he must neither hold, defend, nor teach that opinion in any way whatsoever."[2] Will he please to say whether he remembers in what way and by whom this was intimated to him.

Galileo: "*I do not remember that the command was intimated to me by anybody but by the cardinal verbally;* and I remember that the command was, *not to hold nor defend.* It may be that, 'and *not to teach*' was also there. I do not remember it, neither the definition 'in any way

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[1] No explanation is to be found anywhere of this mysterious notification. The protocols of the trial show that none took place before the Inquisitor. These "particulars," therefore, as they are not mentioned again in the course of the trial, and play no part in it, may have been chiefly of a private nature.

[2] These are the precise words of this ominous passage in the annotation of 26th February, 1616, which appear to have been considered absolutely decisive by the Inquisitor.

whatsoever' (*quovis modo*), but it may be that it was; for I thought no more about it, nor took any pains to impress the words on my memory, as a few months later I received the certificate now produced, of the said Signor Cardinal Bellarmine, of 26th May, in which the injunction given me, *not to hold nor defend* that opinion, is expressly to be found. The two other definitions of the said injunction which have just been made known to me, namely, *not to teach*, and *in any way*, I have not retained in my memory, I suppose, because they are not mentioned in the said certificate, on which I rely, and which I have kept as a reminder."

Galileo thus repeats for the fifth time that he is only aware of the injunction which agrees with the decree of the Congregation of the Index of 5th March, 1616. He can likewise only remember that Cardinal Bellarmine told him of the decree of the Holy Congregation; that a *command* was issued to him, as the Inquisitor asserts, he is not aware; but true to his resolve to make no direct contradiction, he says: "It may be, but I do not remember it." But the Inquisitor treats the issue of the "command" as an established fact; and Galileo, to whom it may have appeared somewhat indifferent whether he was merely informed of the decree of the Congregation, or whether a command in conformity with it was issued to him before witnesses, submissively adopts this assumption of the Inquisitor. He then informs Galileo "that this command issued to him before witnesses contained that he must not in any way hold, defend, nor teach that opinion." Galileo, to whom the two additions, "in any way whatever" and "nor teach," sound new, entrenches himself behind his stereotyped answer, "I do not remember it." Then he appeals to the certificate given him by Cardinal Bellarmine on 26th May, 1616, which does not mention either of these two definitions. To the repeated query *who* intimated the command to him, he invariably replies: "Cardinal Bellarmine." He obviously supposes that the Inquisitor regards the cardinal's communication as the *command*. Galileo's depositions do not contain a word from which it can be inferred that (as the document of 26th February reports), after the cardinal's communication, any further instruction was given him by

the Father Commissary of the Inquisition in the name of the Pope and the Holy Congregation, under threat of a trial before the Inquisition. But it is incredible that this most important proceeding should have entirely escaped Galileo's memory. There are but two alternatives: either it did not take place, and, of course, Galileo cannot remember it; or his ignorance is feigned.

Galileo's attitude before the Inquisition is such that the latter supposition does not seem altogether unjustifiable; but we must assume with Wohlwill, who has analysed the trial with great judicial acumen, and whom we have followed on many points discussed above, that Galileo would only have availed himself of such a lie and misrepresentation, if it would have helped him before the tribunal of the Inquisition. But the advantage of denying any actual proceeding of 26th February is by no means evident. On the contrary, Galileo must have seen—supposing him to make false depositions—from the Inquisitor's questions that he had the protocol of 26th February before him. Of what avail then could a fiction be in face of this document? Of none whatever. It would rather injure his cause by stamping him as a liar. Wohlwill has pointed out that it would have been a masterpiece of cunning to play out the comedy of assumed ignorance from beginning to end of the trial in so consistent a manner, never contradicting himself, as appears from Galileo's depositions. His simplest replies would then have formed parts of a complex tissue of falsehood, and it would be astonishing that throughout the whole course of the trial he should never for a moment deviate from his difficult part.

While the complexity of such a mode of defence renders the assumption of Galileo's denial, to say the least, improbable, there are other more weighty arguments to show that he states before his judges all that he knows about the proceedings in 1616. These arguments consist of all Galileo's statements and actions with which we are acquainted, during the seventeen years from 1616–1632, and they form the

strongest evidence for the credibility of his depositions. We recur first, simply to the letters of the time of the first trial, in which there is not only no trace of the assumed absolute prohibition, but Galileo openly expresses his satisfaction that his enemies have not succeeded in obtaining an entire prohibition of the Copernican theory, and he again and again mentions that the hypothetical discussion of it still remains open. And the attitude maintained by him during the seventeen years towards the new system is in entire conformity with the decree of the Congregation of the Index of 5th March, 1616, which was in force for everybody, but not with the categorical prohibition of the Commissary-General of the Holy Office. This is shown by his eagerness to get his work on Copernicus published in the very year 1616; by his sending the treatise on the tides to the Archduke Leopold of Austria, in 1618; by the discussion of the Copernican theory in his "Il Saggiatore," in 1623; by his efforts in 1624 to get the clause of 5th March, 1616, abolished by the new, and, as he thought, more tolerant Pope (there is no trace that he tried to get any special prohibition to himself revoked); by his reply to Ingoli of the same date, which treated exclusively of the marked defence of the Copernican theory; and finally, by the writing of the famous "Dialogues" themselves, in which he made every endeavour not to come into collision with the published decree of 1616, while the very authorship of the work would have infringed an absolute command to silence on the Copernican system.

We now go back to the first hearing of Galileo. Although his statements, in spite of his submissiveness, obviously contradict the assertion of the Inquisitor, that he had, in 1616, received an injunction not to hold, teach, or defend the Copernican opinions in any way, the Inquisitor does not take the least pains to solve the enigma. Everything is also omitted on the part of the judges which might have cleared up the point; for example, to summon the witnesses, whose names are on the note of 26th February, 1616, and confront

them with the accused. And as no attempt is made to account for his ignorance of the prohibition, and it is simply taken for granted, it must be allowed that Galileo's judges, to say the least, were guilty of a great breach of judicial order, in using, without any close examination, a paper as a valid document on the trial, which was destitute of nearly all the characteristics of one, namely, the signatures of the accused, of the notary and witnesses, and in spite of three contradictory depositions of the accused. No special arguments are needed to prove that this breach of order did not proceed from mere carelessness. And so, immediately after the accused has declared that he does not remember any command but that intimated to him by Cardinal Bellarmine, we find the Inquisitor asking him: Whether, after the aforesaid command was issued to him, he had received any permission to write the book which he had acknowledged to be his, and which he afterwards had printed?

Galileo: "After receiving the command aforesaid, I did not ask permission to write the book acknowledged by me to be mine, because I did not consider that in writing it I was acting contrary to, far less disobeying, the command not to hold, defend, or to teach the said opinion."

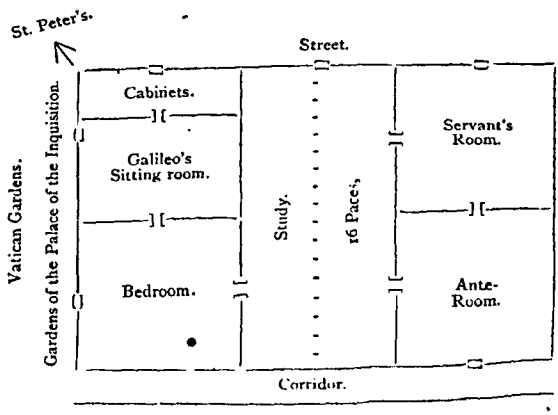
The Inquisitor now asks to be informed whether, from whom, and in what way, Galileo had received permission to print the "Dialogues." Galileo briefly relates the whole course of the negotiations which preceded the printing. As his narrative agrees entirely with what we know, it is not reproduced here. The Inquisitor then asks: Whether, when asking permission to print his book, he had told the Master of the Palace about the command aforesaid, which had been issued to him by order of the Holy Congregation?

Galileo: "I did not say anything about that command to the Master of the Palace when I asked for the *imprimatur* for the book, for I did not think it necessary to say anything, because I had no scruples about it; for I have neither maintained nor defended the opinion that the earth moves and the sun is stationary in that book, but have rather demonstrated the opposite of the Copernican opinion, and shown that the arguments of Copernicus are weak and not conclusive."

With this deposition, the last part of which is quite incorrect, the first hearing closed. Silence having been imposed on Galileo on oath on subjects connected with his trial, he was taken to an apartment in the private residence of the fiscal of the Holy Office in the buildings of this tribunal. Here he enjoyed (as appears from his own letters and Niccolini's reports) kind and considerate treatment. On 16th April he wrote to Geri Bocchineri:—

"Contrary to custom, three large and comfortable rooms have been assigned to me, part of the residence of the fiscal of the Holy Office, with free permission to walk about in the spacious apartments. My health is good, for which, next to God, I have to thank the great care of the ambassador and his wife, who have a watchful eye for all comforts, and far more than I require."[1]

Niccolini had been permitted to board Galileo, and his servants took the meals to his rooms, so that Galileo could keep his own servant about him, and he was even allowed to sleep in the buildings of the Holy Office.[2] No obstacle was placed in the way of free correspondence between Galileo and Niccolini. The former wrote to his exalted friend and



[1] Op. vii. p. 29. The rest of the letter is about family affairs.

[2] Comp. Niccolini's despatch to Cioli of 16th April. (Op. ix. pp. 440, 441.) During our stay in Rome in the spring of 1877, Leone Vincenzo Sallua,

patron daily, and he replied, openly expressing his opinions, without exciting any observation.[1]

While, therefore, as far as his material situation was concerned, nothing but favours unheard of in the annals of the Inquisition were shown him, nothing was left undone to find the best method of effecting his moral ruin. At the beginning of April, when the actual trial was to come on, his faithful friend and advocate, Father Castelli, who was as well versed in theology as he was in mathematics, was sent away from Rome and not recalled until Galileo, who had been meanwhile condemned, had left the city.[2]

Three days after the first examination the three counsellors of the Inquisition, Augustine Oregius, Melchior Inchofer, and Zacharias Pasqualigus delivered their opinions about the trial of Galileo. Oregius declared that "in the book superscribed 'Dialogues of Galileo Galilei,' the doctrine which teaches that the earth moves and that the sun is stationary is *maintained* and *defended*." Inchofer's statements (he drew up two) declared that "Galileo had not only taught and defended that view, but rendered it very suspicious that he was inclined to it, and even held it to this day." Both these attestations were supported by a memorial, in which the opinions given were founded on passages quoted from the "Dialogues."[3]

the Father Commissary-General of the Holy Office, was kind enough to show us the apartments occupied by Galileo in the Palace of the Inquisition. The rooms are all large, light, and cheerful, and on one side you enjoy the prospect of the majestic dome of St. Peter's, and on the other of the beautiful gardens of the Vatican. It is worthy of note that all the rooms assigned to Galileo and his servant are entirely shut off by a single door, so that but one key was required to make the inmates of these handsome apartments prisoners. With all its consideration for Galileo's person, the Inquisition never forgot a certain prudence which had perhaps become a second nature to it. We prefix a little ground plan of the rooms, made by ourselves on the spot.

[1] See despatch of 23rd April. (Op. ix. p. 441.)

[2] See Op. ix. pp. 334, 339, 345, 346, 354, 355. Pieralisi tries to palliate even this act, but without much success. (Comp. pp. 134, 135.)

[3] Thanks to the kindness of Prof. Riccardi, of Modena, in whose valuable

The first sought to prove that Galileo in his book had treated the stability of the sun and its central position in the universe, not as a hypothesis, but in a definite manner; the second, that in it Galileo had taught, defended, and held the doctrine of the earth's motion round the sun.

Zacharias Pasqualigus gave in three opinions. In the first he expresses his view that Galileo, by the publication of his "Dialogues," had infringed the order given him by the Holy Office not in any way to hold the Copernican opinion, nor to teach nor defend it in writing or speaking, in respect to *teaching* and *defending*, and it was very suspicious that he *held* it.

In his second opinion, Pasqualigus argues, by quoting passages from the "Dialogues,"[1] that although in the beginning of the book Galileo had stated that he should treat the doctrine of the double motion only as a hypothesis, he had in the course of it departed from hypothetical language, and sought to prove it by decisive arguments.

Finally, in his third opinion, Pasqualigus recurs to the special prohibition of 1616, and argues at length that Galileo has overstepped it both as regards teaching and defending, and is very strongly open to the suspicion of holding it.[2]

By these declarations Galileo's cause was as good as decided. His transgression of the command of the Holy Office, and particularly of the special prohibition of 26th February, 1616, was proved beyond a doubt. Of his guilt

library there is, among other treasures, a copy of Galileo's "Dialogues" of 1632, I was enabled to compare Inchofer's quotations with a copy of the very edition which was in the hands of the consultators of the Holy Office. I am able to state that Inchofer quotes them verbatim, or makes faithful extracts without altering the sense. The last quotation only, 25, is a little confused. (Vat. MS. fol. 439 vo.)

[1] Pasqualigus seldom cites verbatim, but makes short quotations; and in comparing them with Galileo's works, I have found the sense given correctly.

[2] See all these opinions and the arguments, Vat. MS. fol. 429 ro. 447 ro.

there could be no question—neither could there be any of the penalty.

The prolonged deprivation of exercise in the open air, which had been so essential to the old man's health,[1] combined with great mental agitation, at length threw him on a sick bed. He wrote on 23rd April to Geri Bocchineri :—

"I am writing in bed, to which I have been confined for sixteen hours with severe pains in my loins, which, according to my experience, will last as much longer. A little while ago I had a visit from the commissary and the fiscal who conduct the inquiry. They have promised and intimated it as their settled intention to set me at liberty as soon as I am able to get up again, encouraging me repeatedly to keep up my spirits. I place more confidence in these promises than in the hopes held out to me before, which, as experience has shown, were founded rather upon surmises than real knowledge. I have always hoped that my innocence and uprightness would be brought to light, and I now hope it more than ever. I am getting tired of writing, and will conclude." [2]

The second examination of Galileo took place on 30th April. It has hitherto astounded all those who have studied this famous trial; for while at the close of his first depositions, Galileo decidedly denied having defended the Copernican system in his "Dialogues," and even asserted that he had done just the contrary, at the second hearing, almost without waiting for the Inquisitor's questions, he makes a humble declaration, which, roundabout as it is, contains a penitent confession that he had defended it in his book. The cause of this change in Galileo is explained by a most

[1] There is a passage in a letter of Galileo's to Geri Bocchineri of 25th February, 1633, in which he says: "The cessation of all bodily exercise which, as you know I am accustomed to take for the benefit of my health, and of which I have now been deprived for nearly forty days, begins to tell upon me, and particularly to interfere with digestion, so that the mucus accumulates; and for three days violent pains in the limbs have occasioned great suffering, and deprived me of sleep. I hope strict diet will get rid of them." (Op. vii. p. 23.) Since this time two months had elapsed without Galileo's having been in the open air. Even the Inquisitors saw, as we shall find, that a change must be made in the regulations, if they did not wish to endanger his life.

[2] Op. vii. p. 30.

interesting letter from the Commissary-General of the Inquisition, Father Vincenzo Maccolani da Firenzuola, who was at that time with the Pope in the Castle of Gandolfo, to Cardinal Francesco Barberini. This letter of 28th April, 1633, first published in full by Pieralisi, the learned librarian of the Barberiana at Rome, whom we have so often quoted, is as follows:[1]—

"In compliance with the commands of his Holiness, I yesterday informed the most eminent Lords of the Holy Congregation of Galileo's cause, the position of which I briefly reported. Their Eminences approved of what has been done thus far, and took into consideration, on the other hand, various difficulties with regard to the manner of pursuing the case, and of bringing it to an end. More especially as Galileo has in his examination denied what is plainly evident from the book written by him; since in consequence of this denial there would result the necessity for greater rigour of procedure and less regard to the other considerations belonging to this business. Finally I suggested a course, namely, that the Holy Congregation should grant me permission to treat extra-judicially with Galileo, in order to render him sensible of his error, and bring him, if he recognises it, to a confession of the same. This proposal appeared at first sight too bold, not much hope being entertained of accomplishing this object by merely adopting the method of argument with him; but upon my indicating the grounds upon which I had made the suggestion, permission was granted me. That no time might be lost, I entered into discourse with Galileo yesterday afternoon, and after many arguments and rejoinders had passed between us, by God's grace I attained my object, for I brought him to a full sense of his error, so that he clearly recognised that he had erred, and had gone too far in his book. And to all this he gave expression in words of much feeling, like one who experienced great consolation in the recognition of his error, and he was also willing to confess it judicially. He requested, however, a little time in order to consider the form in which he might most fittingly make the confession, which, as far as its substance is concerned, will, I hope, follow in the manner indicated.

I have thought it my duty at once to acquaint your Eminence with this matter, having communicated it to no one else; for I trust that his Holiness and your Eminence will be satisfied that in this way the affair is being brought to such a point that it may soon be settled without difficulty. The court will maintain its reputation: it will be possible to deal leniently with the culprit; and whatever the decision arrived at, he will recognise the favour shown him, with all the other consequences of satis-

[1] Pages 197, 198.

faction herein desired. To-day I think of examining him in order to obtain the said confession ; and having, as I hope, received it, it will only remain to me further to question him with regard to his intention, and to impose the prohibitions upon him ; and that done, he might have the house [1] assigned to him as a prison, as hinted to me by your Eminence, to whom I offer my most humble reverence.

Rome, 28th April, 1633.

Your Eminence's humble and most obedient servant,

FRA VINC° DA FIRENZUOLA."

The second hearing did not take place on the 28th, as Firenzuola proposed, but not till the 30th, perhaps on account of Galileo's indisposition. He had again to take an oath that he would speak the truth, after which he was requested to state what he had to say. He then began the following melancholy confession :—

" In the course of some days' continuous and attentive reflection on the interrogations put to me on the 16th of the present month, and in particular as to whether, sixteen years ago, an injunction was intimated to me by order of the Holy Office, forbidding me to hold, defend, or teach 'in any manner,' the opinion that had just been condemned,—of the motion of the earth and the stability of the sun,—it occurred to me to re-peruse my printed dialogue, which for three years I had not seen, in order carefully to note whether, contrary to my most sincere intention, there had, by inadvertence, fallen from my pen anything from which a reader or the authorities might infer not only some taint of disobedience on my part, but also other particulars which might induce the belief that I had contravened the orders of the Holy Church. And being, by the kind permission of the authorities, at liberty to send about my servant, I succeeded in procuring a copy of my book, and having procured it I applied myself with the utmost diligence to its perusal, and to a most minute consideration thereof. And as, owing to my not having seen it for so long, it presented itself to me, as it were, like a new writing and by another author, I freely confess that in several places it seemed to me set forth in such a form that a reader ignorant of my real purpose might have had reason to suppose that the arguments adduced on the false side, and which it was my intention to confute, were so expressed as to be calculated rather to compel conviction by their cogency than to be easy of solution. Two arguments there are in particular—the one taken from the solar spots, the other from the ebb and flow of the tide—which in truth come to the ear of the reader with far greater show of force and power than

[1] Niccolini's.

ought to have been imparted to them by one who regarded them as inconclusive, and who intended to refute them, as indeed I truly and sincerely held and do hold them to be inconclusive and admitting of refutation. And, as excuse to myself for having fallen into an error so foreign to my intention, not contenting myself entirely with saying that when a man recites the arguments of the opposite side with the object of refuting them, he should, especially if writing in the form of dialogue, state these in their strictest form, and should not cloak them to the disadvantage of his opponent,—not contenting myself, I say, with this excuse,—I resorted to that of the natural complacency which every man feels with regard to his own subtleties and in showing himself more skilful than the generality of men, in devising, even in favour of false propositions, ingenious and plausible arguments. With all this, although with Cicero '*avidior sim gloriae quam satis est*,' if I had now to set forth the same reasonings, without doubt I should so weaken them that they should not be able to make an apparent show of that force of which they are really and essentially devoid. My error, then, has been—and I confess it—one of vainglorious ambition, and of pure ignorance and inadvertence.

This is what it occurs to me to say with reference to this particular, and which suggested itself to me during the re-perusal of my book." [1]

After making this humiliating declaration, Galileo was allowed immediately to withdraw. No questions were put to him this time. But he must have thought that he ought to go still further in the denial of his inmost convictions, further even than Father Firenzuola had desired in his extra-judicial interview, further than the Inquisition itself required. He did not consider the penitent acknowledgment of the "error" into which he had fallen in writing his "Dialogues" sufficient. The Inquisition was to be conciliated by the good resolution publicly to correct it. He therefore returned at once to the court where the sacred tribunal was still sitting, and made the following undignified proposition:—

"And in confirmation of my assertion that I have not held and do not hold as true the opinion which has been condemned, of the motion of the earth and the stability of the sun,—if there shall be granted to me, as I desire, means and time to make a clearer demonstration thereof, I am ready to do so: and there is a most favourable opportunity for this, seeing that in the work already published, the interlocutors agree to meet again after a certain time to discuss several distinct problems of nature, connected with

[1] Vat. MS. fol. 419 ro. 420 vo.

the matter discoursed of at their meetings. As this affords me an opportunity of adding one or two other 'days,' I promise to resume the arguments already adduced in favour of the said opinion, which is false and has been condemned, and to confute them in such most effectual method as by the blessing of God may be supplied to me. I pray, therefore, this sacred tribunal to aid me in this good resolution, and to enable me to put it in effect."[1]

It is hard to pass an adverse judgment on such a hero of science; and yet the man who repeatedly denies before his judges the scientific convictions for which he had striven and laboured for half a century, who even proposes in a continuation of his monumental work on the two chief systems of the world to annihilate all the arguments therein adduced for the recognition of the only true system, can never be absolved by the historical critic from the charge of weakness and insincere obsequiousness. It was, however, the century the opening of which had been ominously marked by the funeral pile of Giordano Bruno, and but eight years before, the corpse of Marc 'Antonio de Dominis,—the famous Archbishop of Spalato, who had died suddenly in the prisons of the Engelsburg during his trial before the Inquisition,—had, after the sentence of the Holy Tribunal, been taken from its resting place and publicly burnt in Rome, together with his heretical writings.

[1] Vat. MS. fol. 420 vo. 421 ro.

CHAPTER VIII.

THE TRIAL CONTINUED.

Galileo allowed to return to the Embassy.—His Hopefulness.—Third Hearing.—Hands in his Defence.—Agreement of it with previous Events.—Confident Hopes of his Friends.—Niccolini's Fears.—Decision to examine Galileo under threat of Torture.—Niccolini's Audience of the Pope.—Informed that the Trial was over, that Galileo would soon be sentenced, and would be imprisoned.—Final Examination.—Sent back to "*locum suum*."—No Evidence that he suffered Torture or was placed in a Prison Cell.

ON the day on which the second hearing had taken place, at Firenzuola's suggestion to the Pope, Galileo was permitted, in consideration of his age and infirmities, to return to the hotel of the Tuscan ambassador, on oath not to leave it, not to hold any intercourse with any one but the inmates of the house, to present himself before the Holy Office whenever summoned, and to maintain the strictest silence about the course of the trial.[1] On the very next day Niccolini wrote to Cioli with great satisfaction: "Signor Galileo was yesterday sent back to my house when I was not at all expecting him, and although the trial is not yet ended."[2] The Tuscan Secretary of State replied on 4th May, with the curt observation: "His Highness was much pleased at the liberation of Signor Galileo," and immediately adds the ill-humoured and unworthy remark: "It appears to me that I must remind your Excellency that when I wrote to you to entertain Signor Galileo at the embassy, the time specified was one month, and the expenses of the remaining time must

[1] Vat. MS. fol. 421 vo. [2] Op. ix. pp. 441, 442.

fall upon himself."[1] Niccolini replied with ill-concealed indignation: "It would not become me to speak of this subject to Galileo while he is my guest; I would rather bear the expense myself, which only comes to fourteen or fifteen scudi a month, everything included; so that if Galileo should remain here the whole summer, that is six months, the outlay for him and his servant would amount to about from ninety to a hundred scudi."[2]

Galileo, who had no idea that his generous protector, Niccolini, had even had to go into unpleasant questions about his support, was entertaining the most confident hopes of a successful and speedy termination of his trial. Although his letters of this period are unfortunately not extant,[3] we see from the answers of his correspondents what sanguine accounts he sent them. Geri Bocchineri wrote on 12th May:

"I have for a long time had no such consolatory news as that which your letter of the 7th brought me. It gives me well-founded hopes that the calumnies and snares of your enemies will be in vain; and in the end, the annoyances involved in the defence, maintenance, and perhaps even increase, of your reputation, can be willingly borne, as you undoubtedly have borne them, since you have gained far more than you have lost by the calamity that has fallen upon you! My pleasure is still more enhanced by the news that you expect to be able to report the end of the affair in the next letter."[4]

But many a post day was to pass over, many a letter from Galileo to be received, before his trial was to come to the conclusion he so little anticipated.

On 10th May he was summoned for the third time before the Holy Tribunal, where Father Firenzuola, the Commissary-General of the Inquisition, informed him that eight days were allowed him in which to write a defence if he wished

[1] Wolynski, "La Diplomazia Toscana," etc., p. 61.

[2] See Niccolini to Cioli, 15th May, 1633. (Op. ix. p. 442.)

[3] Galileo's letters between 23rd April and 23rd July, just the most interesting time, are entirely wanting, which can scarcely be altogether accidental.

[4] Op. ix. p. 353.

to submit one. But Galileo handed it in *at once*,[1] from which we may conclude that he had been informed of this proceeding beforehand. It was as follows:—

"When asked if I had signified to the Reverend Father, the Master of the Sacred Palace, the injunction privately laid upon me, about sixteen years ago, by order of the Holy Office, not to hold, defend, or 'in any way' teach the doctrine of the motion of the earth and the stability of the sun, I answered that I had not done so. And not being questioned as to the reason why I had not intimated it, I had no opportunity to add anything further. It now appears to me necessary to state the reason, in order to demonstrate the purity of my intention, ever foreign to the employment of simulation or deceit in any operation I engage in. I say, then, that as at that time reports were spread abroad by evil-disposed persons, to the effect that I had been summoned by the Lord Cardinal Bellarmine to abjure certain of my opinions and doctrines, and that I had consented to abjure them, and also to submit to punishment for them, I was thus constrained to apply to his Eminence, and to solicit him to furnish me with an attestation, explaining the cause for which I had been summoned before him; which attestation I obtained, in his own handwriting, and it is the same that I now produce with the present document.[2] From this it clearly appears that it was merely announced to me that the doctrine attributed to Copernicus of the motion of the earth and the stability of the sun must not be held or defended, and . . . [Here the MS. is defaced.] beyond this general announcement affecting every one, any other injunction in particular was intimated to me, no trace thereof appears there. Having, then, as a reminder, this authentic attestation in the handwriting of the very person who intimated the command to me, I made no further application of thought or memory with regard to the words employed in announcing to me the said order not to hold or defend the doctrine in question; so that the two articles of the order—in addition to the injunction not to 'hold' or 'defend' it—to wit, the words 'nor to teach it' 'in any way whatsoever'—which I hear are contained in the order intimated to me, and registered—struck me as quite novel and as if I had not heard them before; and I do not think I ought to be disbelieved when I urge that in the course of fourteen or sixteen years I had lost all recollection of them, especially as I had no need to give any particular thought to them, having in my possession so authentic a reminder in writing. Now, if the said two articles be left out, and those two only be retained which are noted in the accompanying attestation,

[1] See the protocol of the hearing of 10th May, 1633. (Vat. MS. fol. 422 ro.)

[2] At his first hearing Galileo had only been able to show a copy of this certificate, but now produced the original.

there is no doubt that the injunction contained in the latter is the same command as that contained in the decree of the Sacred Congregation of the Index. Whence it appears to me that I have a reasonable excuse for not having notified to the Master of the Sacred Palace the command privately imposed upon me, it being the same as that of the Congregation of the Index.

Seeing also, that my book was not subject to a stricter censorship than that made binding by the decree of the Index, it will, it appears to me, be sufficiently plain that I adopted the surest and most becoming method of having it guaranteed and purged of all shadow of taint, inasmuch as I handed it to the supreme Inquisitor at the very time when many books dealing with the same matters were being prohibited solely in virtue of the said decree. After what I have now stated, I would confidently hope that the idea of my having knowingly and deliberately violated the command imposed upon me, will henceforth be entirely banished from the minds of my most eminent and wise judges; so that those faults which are seen scattered throughout my book have not been artfully introduced with any concealed or other than sincere intention, but have only inadvertently fallen from my pen, owing to a vainglorious ambition and complacency in desiring to appear more subtle than the generality of popular writers, as indeed in another . . . [MS. defaced.] deposition I have confessed: which fault I shall be ready to correct by writing whenever I may be commanded or permitted by your Eminences.

Lastly, it remains for me to pray you to take into consideration my pitiable state of bodily indisposition, to which, at the age of seventy years, I have been reduced by ten months of constant mental anxiety and the fatigue of a long and toilsome journey at the most inclement season—together with the loss of the greater part of the years of which, from my previous condition of health, I had the prospect. I am persuaded and encouraged to do so by the clemency and goodness of the most eminent lords, my judges; with the hope that they may be pleased, in answer to my prayer, to remit what may appear to their entire justice . . . to such sufferings as adequate punishment—out of consideration for my declining age, which too, I humbly commend to them. And I would equally commend to their consideration my honour and reputation, against the calumnies of ill-wishers, whose persistence in detracting from my good name may be inferred from the necessity which constrained me to procure from the Lord Cardinal Bellarmine the attestation which accompanies this."[1]

This touching appeal to the mercy of the judges of the Holy Office can scarcely be read without feelings of the profoundest pity for the unhappy old man, who, in the evening

[1] Vat. MS. fol. 425 vo.

of his days, felt compelled by dread of the stake to deny his scientific convictions.

In looking at the defence in a judicial light, in spite of mistrust in the truthfulness of the accused, for which there is some justification, it must be allowed that his statements about the proceedings of sixteen years before, agree entirely with all his letters and actions from 1616 to 1632. In view of this state of the case, Galileo's remark in his defence that "he had received that certificate from the very person who had intimated the command to him," possesses increased significance. His whole defence is intended to convince the judges that the two particulars "not to teach" and "in any way" were unknown to him up to the day of his first hearing, or, as he says, to avoid direct contradiction, "he had lost all recollection of them." He obviously thinks that the gravity of the indictment lies in these words. But he seems to be absolutely ignorant of their having been issued to him after the previous admonition of the Cardinal, by the Commissary-General of the Inquisition, with the threat that "otherwise they would proceed against him in the Holy Office," indeed, by the above remark he decidedly contradicts it. Apologists of the Inquisition at any price, of the stamp of Mgr. Marini, do not fail to adopt the only means left to them, and call Galileo's defence "childish evasions unworthy of so great a man, which are sure signs of guilt."[1] We are of opinion, on the contrary, that the confident hopes of a favourable issue of his trial, by which, as appears from the replies of his correspondents and Niccolini's despatches, Galileo was animated up to the last moment, by no means comport with consciousness of guilt.

After his defence had been received, and the same obligations imposed on him on oath as after the second hearing, he was allowed to return to the embassy. The nearer the time approached when the old man's illusions were to be dispelled, the more sanguine was the intelligence he sent to his friends.

[1] Comp. Marini, pp. 98–100.

He reminds one of a consumptive patient, full of hope when in the last stage of his disorder. Galileo receives in reply to his letters the congratulations of his friends on the, as they suppose, doubtless favourable issue of his trial. Cardinal Capponi writes on 21st May, that he had never expected anything else.[1] Bocchineri, Guiducci, Agguinti, Cini, and others heartily express their satisfaction;[2] the Archbishop of Siena, Ascanio Piccolomini, Galileo's devoted friend, invites him, in expectation of his speedy dismissal from Rome, to come and see him at Siena, that he may await the extinction of the plague at Florence.[3] Galileo accepts the friendly invitation, and informs Bocchineri that he intends to go to Siena immediately after the end of the trial.[4] Archbishop Piccolomini even offers his impatiently expected guest a litter for the journey.[5] A favour granted to Galileo just at the last, on the urgent solicitation of Niccolini, and quite unheard of in the annals of the Inquisition, might have increased these confident hopes. He was permitted to take the air for the sake of his health in the gardens of the Castle of Gandolfo, to which, however, he was always conveyed in a half-closed carriage, as he was not to be seen in the streets.[6]

Niccolini, however, did not share the hopes of his famous guest, and for very good reasons. He had had an audience, on 21st May, of the Pope and Cardinal Barberini, who had told him in answer to his inquiries when the trial might be expected to end, that it would probably be concluded in the congregation to take place in about a fortnight. After reporting this in his despatch to Cioli of 22nd May, Niccolini continues: "I very much fear that the book will be prohibited, unless it is averted by Galileo's being charged, as I proposed, to write an apology. Some 'salutary penance' will also be

[1] Op. ix. p. 357.
[2] See their letters (Op. ix. pp. 355–364; and Suppl. pp. 350, 351).
[3] See his letters to Galileo (Op. Suppl. pp. 248–250).
[4] Op. ix. p. 359.
[5] Ibid. p. 365.
[6] See Niccolini's despatches to Cioli of 29th May. (Op. ix. p. 443.)

imposed upon him, as they maintain that he has transgressed the command communicated to him by Cardinal Bellarmine in 1616. I have not yet told him all this, because I want to prepare him for it by degrees, in order not to distress him. It will also be advisable to observe silence about this in Florence, that he may not hear it from his friends there; and the more so, as it may turn out otherwise."[1] It was indeed "to turn out otherwise," but in a way that even Niccolini did not in the least suspect.

A momentary lull now took place in Galileo's trial—the preparation for the great catastrophe that was to take all the world by surprise. Sultry silence reigned for four weeks. No one, not even Niccolini, could learn anything about the progress of the affair; the thunderbolt had already fallen which was to crush the accused before it was known to anyone beyond the Holy Congregation. His fate had been sealed in a private meeting of it presided over by the Pope. Unfortunately we have no written notes of the proceedings of this highly interesting sitting. From two documents, which agree entirely in essentials, we simply know what the decrees were which minutely prescribed the final proceedings to be taken against Galileo. One of these documents is derived from the Vatican collection of the acts of Galileo's trial; the other is reproduced in Gherardi's collection of documents, and belongs to the MS. originals of the decrees drawn up in the sittings of the Holy Congregation in the archives of the Inquisition.

It is decreed in both documents[2] which agree almost verbatim: To try Galileo *as to his intention, and under threat of*

[1] Op. ix. pp. 442, 443.

[2] "Feria V. Die XVI. Junii 1633.

Galilaei de Galileis Florentini in hoc S. Off. carcerati et ob ejus adversam valetudinem ac senectutem cum praecepto de non discedendo de domo electae habitationis in urbe, ac de se repraesentando toties quoties sub poenis arbitrio Sacrae Congregationis habilitati proposita causa relato processu et auditis notis, S. mus decrevit ipsum Galilaeum interrogandum esse super intentione et comminata ei tortura, et si sustinuerit, previa abjuratione de vehementi in plena Congregatione S. Off. condemnandum

torture; if he kept firm, he was to be called upon to recant before a plenary assembly of the Congregation of the Holy Office, condemned to imprisonment according to the judgment of the Holy Congregation, and ordered in future not to discuss, either in writing or speaking, the opinion that the earth moves and the sun is stationary, nor yet the contrary opinion, under pain of further punishment for contumacy; further, the work, "Dialogo di Galileo Galilei, Linceo," was to be prohibited. And in order to make this known everywhere, copies of the sentence were to be sent to all papal envoys, and all inquisitors into heretical crimes, and specially to the Inquisitor of Florence, who was to proclaim it in a full conclave of the Congregation, and read it publicly to a majority of the professors of mathematics summoned for the purpose.

It is noteworthy that it was expressly decreed that Galileo was to be enjoined, "nor yet to discuss the contrary opinion," the Ptolemaic. They obviously accredited the clever dialectician with the skill, under pretext of defending the old system, of demonstrating exactly the contrary. It therefore seemed most prudent to impose absolute silence on him on this delicate subject.

ad carcerem arbitrio Sac. Congregationis, Injunctum ei ne de cetero scripto vel verbo tractet ampluis gnovis modo de mobilitate terræ, nec de stabilitate solis et e contra sub poena relapsus. Librum vero ab eo conscriptum cuititutus est Dialogo di Galileo Galilei Linceo (publice cremandum fore (*sic*) ma cassato) prohibendum fore. Praeterea ut haec omnibus innotescant exemplaria Sententiae Decretumque perinde transmitti jussit ad omnes nuntios apostolicos, et ad omnes haereticae pravitatis Inquisitores, ac praecipue ad Inquisitorem Florentiae qui eam sententiam in ejus plena Congregatione, Consultoribus accersitis, etiam et coram plerisque Mathematicae Artis Professoribus publice legatur." (Gherardi's Documents, Doc. xiii.; and Vat. MS. fol. 451 vo.)

It was then apparently at first determined publicly to burn Galileo's book, and it was not till after the decree had been committed to writing that it was altered. At whose instigation this was done, whether at that of the Pope, or in consequence of the remonstrances of some more lenient members of the Congregation, such as the Cardinals Barberini, Borgia, and Zacchia, cannot be decided.

Two days after the course of the proceedings had been secretly determined on, the Pope gave audience to Niccolini, who once more came to beg for a speedy termination of the trial. Urban VIII. said that it had already been terminated, and that within the next few days Galileo would be summoned before the Holy Office to hear his sentence. The ambassador, who was terrified at this unexpected intelligence, hastened to implore his Holiness, out of respect for his Highness the Grand Duke, to mollify the severity which the Holy Congregation might perhaps have thought it necessary to exercise; and added obligingly that the great complaisance shown to the Grand Duke in the matter of Galileo was fully appreciated, and that the Grand Duke was only awaiting the end of the business to express his gratitude in person. The Pope replied, with equal suavity, that his Highness need not take this trouble, as he had readily granted every amelioration to Galileo out of affection for him; but as to his cause, they could do no less than prohibit that opinion, because it was erroneous and contrary to Holy Scripture, dictated *ex ore Dei;* as to his person, he would, according to usage, be imprisoned for a time, *because he had transgressed the mandate issued to him in* 1616. "However," added Urban, "after the publication of the sentence we will see you again, and we will consult together so that he may suffer as little distress as possible, since it cannot be let pass without some demonstration against his person." In reply to Niccolini's renewed urgent entreaties that his Holiness would extend his accustomed mercy to the pitiable old man of seventy, the Pope said that "he would at any rate be sent for a time to some monastery, as for instance, St. Croce; for he really did not know precisely what the Holy Congregation might decree (?!), but it was unanimous and *nemine discrepante* in intending to impose a penance on Galileo."

The very same day the ambassador sent a detailed despatch about this audience to Cioli,[1] and remarked at the end

[1] Op. ix. pp. 443, 444, from which the above account is taken.

that he had simply informed Galileo of the approaching end of the trial, and of the prohibition of his book, but had said nothing about the personal punishment, in order not to trouble him too much at once; the Pope had also enjoined this, that Galileo might not distress himself yet, and "because perhaps in the course of the proceedings things might take a better turn."

Galileo's trial now proceeded strictly according to the programme settled by the Congregation of the Holy Office under the papal presidency. On the evening of Monday, 20th June, Galileo received a summons from the Holy Office to appear the next day.[1] In this final hearing the accused was to be questioned, under threat of torture, about his intention, that is, as to his real conviction concerning the two systems. On the morning of the 21st Galileo appeared before his judges. After he had taken the usual oath, and had answered in the negative the query whether he had any statement to make, the examiner began as follows:—

Interrogated whether he holds or has held, and how long ago, that the sun is the centre of the world and that the earth is not the centre of the world, and moves, and also with a diurnal motion;

He answered: "A long time ago, *i.e.*, before the decision of the Holy Congregation of the Index, and before the injunction was intimated to me, I was indifferent, and regarded both opinions, namely, that of Ptolemy and that of Copernicus, as open to discussion, inasmuch as either one or the other might be true in nature; but after the said decision, assured of the wisdom of the authorities, I ceased to have any doubt; and I held, as I still hold, as most true and indisputable, the opinion of Ptolemy, that is to say, the stability of the earth and the motion of the sun."

Being told that from the manner and connection in which the said opinion is discussed in the book printed by him subsequently to the time mentioned—nay, from the very fact

[1] See Niccolini's despatch to Cioli, 26th June. (Op. ix. pp. 444, 445.)

of his having written and printed the said book, he is presumed to have held this opinion after the time specified; and being called upon to state the truth as to whether he holds or has held the same;

He answered: "As regards the writing of the published dialogue, my motive in so doing was not because I held the Copernican doctrine to be true, but simply thinking to confer a common benefit, I have set forth the proofs from nature and astronomy which may be adduced on either side; my object being to make it clear that neither the one set of arguments nor the other has the force of conclusive demonstration in favour of this opinion or of that; and that therefore, in order to proceed with certainty we must have recourse to the decisions of higher teaching, as may be clearly seen from a large number of passages in the dialogue in question. I affirm, therefore, on my conscience, that I do not now hold the condemned opinion, and have not held it since the decision of the authorities."

Being told that from the book itself and from the arguments adduced on the affirmative side,—namely, that the earth moves and that the sun is immovable,—it is presumed, as aforesaid, that he holds the opinion of Copernicus, or at least that he held it at that time; and that therefore, unless he make up his mind to confess the truth, recourse will be had against him to the appropriate remedies of the law;

He answered: "I do not hold, and have not held this opinion of Copernicus since the command was intimated to me that I must abandon it; for the rest, I am here in your hands,—do with me what you please." Being once more bidden to speak the truth, otherwise recourse will be had to torture, the terrified old man answered with the resignation of despair: "I am here to obey, and I have not held this opinion since the decision was pronounced, as I have stated."

In the protocol of the trial the concluding sentence follows immediately after this last answer of Galileo's: "And as nothing further could be done in execution of the decree

(of 16th June), his signature was obtained to his deposition, and he was sent back to his place."[1]

There is not in this document, nor in any other extant, the slightest trace that torture was actually applied to Galileo, as has long and even recently been fabled. Since the publication of it by Epinois has acquainted us with the decree of 16th June, none such can be expected ever to be found. In that decree the course of the final legal proceedings was precisely indicated. But it was only the *threat* of torture that was prescribed, after which recantation and sentence of imprisonment were to follow. The execution of this threat, then, would have been a gross, and under the circumstances, incredible violation of the decrees of the Holy Office itself. Moreover, the assumed torture of Galileo is opposed, as we shall see by and by, to various historical facts. When the whole course of the trial is unrolled before our eyes, we shall go more deeply into the region of fable and malicious fabrication.

But as we pursue the path of history, we come upon an error which Mgr. Marini's peculiar mode of interpretation has given rise to. He takes the concluding words of the protocol of the trial of 21st June, "remissus fuit ad locum suum," to mean that Galileo was sent back to the Tuscan embassy.[2] Now, it is indisputable, from a despatch of Niccolini's to Cioli of 26th June, 1633, that after the hearing of the 21st June, the accused was detained in the buildings of the Holy Office, and did not leave them till the 24th.[3]

[1] Et cu nihil aliud posset haberi in executione decreti habita eius subscriptione remissus fuit ad locum suum. (Vat. MS. fol. 453 ro.)

[2] "Cioè al palazzo del Ministro di Toscana," says Marini, p. 62.

[3] The passage in Niccolini's despatch is as follows: Il Signor Galilei fu chiamato lunedi (20) sera al S. Uffizio, ove si trasferi martedi (21) mattina conforme all' ordine, per sentire qual che potessero desiderare da lui, ed essendo ritenuto, fu condotto mercoledi (22) alla Minerva avanti alli Sig. Cardinali e Prelati della Congregazione, dove non solamente gli fu letta la sentenza, ma fatto anche abiurare la sua opinione, . . . la qual condannazione gli fu subito permutata da S. B. in una relegazione o confine al giardino della Trinita de' Monti, dore io lo condussi venerdi (24) sera . . . ." (Op. ix. pp. 444, 445.)

We have no information whatever as to the treatment he met with this time in the buildings of the Holy Office. Was he put into the apartments he had occupied before, or was he confined in a prisoner's cell? From the considerate treatment in outward things which Galileo met with during his trial at Rome, it may perhaps be concluded *that he never was thrown into the dungeons of the Inquisition.*

CHAPTER IX.

THE SENTENCE AND RECANTATION.

The Sentence in full.—Analysis of it.—The Copernican System had not been pronounced heretical by "Infallible" Authority.—The Special Prohibition assumed as Fact.—The Sentence illegal according to the Canon Law.—The Holy Office exceeded its powers in calling upon Galileo to recant.—The Sentence not unanimous.—This escaped notice for two hundred and thirty-one Years.—The Recantation.—Futile attempts to show that Galileo had really altered his Opinion.—After the Sentence, Imprisonment exchanged for Banishment to Trinita de' Monti.—Petition for leave to go to Florence.—Allowed to go to Siena.

ON Wednesday, 22nd June, 1633, in the forenoon, Galileo was conducted to the large hall used for melancholy proceedings of this kind, in the Dominican Convent of St. Maria sopra la Minerva, where, in the presence of his judges and a large assemblage of cardinals and prelates of the Holy Congregation, the following sentence was read to him :—

WE, Gasparo del titolo di S. Croce in Gierusalemme Borgia ;
Fra Felice Centino del titolo di S. Anastasia, detto d'Ascoli ;
Guido del titolo di S. Maria del Popolo Bentivoglio ;
Fra Desiderio Scaglia del titolo di S. Carlo detto di Cremona ;
Fra Antonio Barbèrino detto di S. Onofrio ;
Laudivio Zacchia del titolo di S. Pietro in Vincola detto di S. Sisto ;
Berlingero del titolo di S. Agostino, Gessi ;
Fabricio del titolo di S. Lorenzo in pane e perna, Verospi, chiamato Prete ;
Francesco di S. Lorenzo in Damaso Barberino, e
Martio di S. Maria Nuova Ginetti Diaconi ;

by the grace of God, cardinals of the Holy Roman Church, Inquisitors General, by the Holy Apostolic see specially deputed, against heretical depravity throughout the whole Christian Republic.

Whereas you, Galileo, son of the late Vincenzo Galilei, Florentine, aged seventy years, were in the year 1615 denounced to this Holy Office for holding as true the false doctrine taught by many, that the sun is the centre of the world and immovable, and that the earth moves, and also with a diurnal motion; for having disciples to whom you taught the same doctrine; for holding correspondence with certain mathematicians of Germany concerning the same; for having printed certain letters, entitled "On the Solar Spots," wherein you developed the same doctrine as true; and for replying to the objections from the Holy Scriptures, which from time to time were urged against it, by glossing the said Scriptures according to your own meaning: and whereas there was thereupon produced the copy of a document in the form of a letter, purporting to be written by you to one formerly your disciple, and in this divers propositions are set forth,[1] following the hypothesis of Copernicus, which are contrary to the true sense and authority of Holy Scripture:

This Holy Tribunal being therefore desirous of proceeding against the disorder and mischief thence resulting, which went on increasing to the prejudice of the Holy Faith, by command of his Holiness and of the most eminent Lords Cardinals of this supreme and universal Inquisition, the two propositions of the stability of the sun and the motion of the earth were by the theological "Qualifiers" qualified as follows:

The proposition that the sun is the centre of the world and does not move from its place is absurd and false philosophically and formally heretical, because it is expressly contrary to the Holy Scripture.

The proposition that the earth is not the centre of the world and immovable, but that it moves, and also with a diurnal motion, is equally absurd and false philosophically, and theologically considered, at least erroneous in faith.

But whereas it was desired at that time to deal leniently with you, it was decreed at the Holy Congregation held before his Holiness on the 25th February, 1616, that his Eminence the Lord Cardinal Bellarmine should order you to abandon altogether the said false doctrine, and, in the event of your refusal, that an injunction should be imposed upon you by the Commissary of the Holy Office, to give up the said doctrine, and not to teach it to others, nor to defend it, nor even discuss it; and failing your acquiescence in this injunction, that you should be imprisoned. And in execution of this decree, on the following day, at the Palace, and in the presence of his Eminence, the said Lord Cardinal Bellarmine, after being gently admonished by the said Lord Cardinal, the command was intimated to you by the Father Commissary of the Holy Office for the time before a notary and witnesses, that you were altogether to abandon the said false opinion, and not in future to defend or teach it in any way whatsoever, neither verbally nor in writing; and upon your promising to obey you were dismissed.

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[1] Galileo's letter to Castelli of 21st December, 1613.

And in order that a doctrine so pernicious might be wholly rooted out and not insinuate itself further to the grave prejudice of Catholic truth, a decree was issued by the Holy Congregation of the Index, prohibiting the books which treat of this doctrine, and declaring the doctrine itself to be false and wholly contrary to sacred and divine Scripture.

And whereas a book appeared here recently, printed last year at Florence, the title of which shows that you were the author, this title being: "Dialogue of Galileo Galilei on the Two Principal Systems of the World, the Ptolemaic and the Copernican"; and whereas the Holy Congregation was afterwards informed that through the publication of the said book, the false opinion of the motion of the earth and the stability of the sun was daily gaining ground; the said book was taken into careful consideration, and in it there was discovered a patent violation of the aforesaid injunction that had been imposed upon you, for in this book you have defended the said opinion previously condemned and to your face declared to be so, although in the said book you strive by various devices to produce the impression that you leave it undecided, and in express terms as probable: which however is a most grievous error, as an opinion can in no wise be probable which has been declared and defined to be contrary to Divine Scripture:

Therefore by our order you were cited before this Holy Office, where, being examined upon your oath, you acknowledged the book to be written and published by you. You confessed that you began to write the said book about ten or twelve years ago, after the command had been imposed upon you as above; that you requested licence to print it, without however intimating to those who granted you this licence that you had been commanded not to hold, defend, or teach in any way whatever the doctrine in question.

You likewise confessed that the writing of the said book is in various places drawn up in such a form that the reader might fancy that the arguments brought forward on the false side are rather calculated by their cogency to compel conviction than to be easy of refutation; excusing yourself for having fallen into an error, as you alleged, so foreign to your intention, by the fact that you had written in dialogue, and by the natural complacency that every man feels in regard to his own subtleties, and in showing himself more clever than the generality of men, in devising, even on behalf of false propositions, ingenious and plausible arguments.

And a suitable term having been assigned to you to prepare your defence, you produced a certificate in the handwriting of his Eminence the Lord Cardinal Bellarmine, procured by you, as you asserted, in order to defend yourself against the calumnies of your enemies, who gave out that you had abjured and had been punished by the Holy Office; in which certificate it is declared that you had not abjured and had not been punished, but merely that the declaration made by his Holiness and published by the Holy Congregation of the Index, had been announced to you, wherein

it is declared that the doctrine of the motion of the earth and the stability of the sun is contrary to the Holy Scriptures, and therefore cannot be defended or held. And as in this certificate there is no mention of the two articles of the injunction, namely, the order not "to teach" and "in any way," you represented that we ought to believe that in the course of fourteen or sixteen years you had lost all memory of them; and that this was why you said nothing of the injunction when you requested permission to print your book. And all this you urged not by way of excuse for your error, but that it might be set down to a vainglorious ambition rather than to malice. But this certificate produced by you in your defence has only aggravated your delinquency, since although it is there stated that the said opinion is contrary to Holy Scripture, you have nevertheless dared to discuss and defend it and to argue its probability; nor does the licence artfully and cunningly extorted by you avail you anything, since you did not notify the command imposed upon you.

And whereas it appeared to us that you had not stated the full truth with regard to your intention, we thought it necessary to subject you to a rigorous examination, at which (without prejudice, however, to the matters confessed by you, and set forth as above, with regard to your said intention) you answered like a good Catholic. Therefore, having seen and maturely considered the merits of this your cause, together with your confessions and excuses above mentioned, and all that ought justly to be seen and considered, we have arrived at the underwritten final sentence against you:—

Invoking, therefore, the most holy name of our Lord Jesus Christ and of His most glorious Mother, and ever Virgin Mary, by this our final sentence, which sitting in judgment, with the counsel and advice of the Reverend Masters of sacred theology and Doctors of both Laws, our assessors, we deliver in these writings, in the cause and causes presently before us between the magnificent Carlo Sinceri, Doctor of both Laws, Proctor Fiscal of this Holy Office, of the one part, and you Galileo Galilei, the defendant, here present, tried and confessed as above, of the other part,—we say, pronounce, sentence, declare, that you, the said Galileo, by reason of the matters adduced in process, and by you confessed as above, have rendered yourself in the judgment of this Holy Office vehemently suspected of heresy, namely, of having believed and held the doctrine—which is false and contrary to the sacred and divine Scriptures—that the sun is the centre of the world and does not move from east to west, and that the earth moves and is not the centre of the world; and that an opinion may be held and defended as probable after it has been declared and defined to be contrary to Holy Scripture; and that consequently you have incurred all the censures and penalties imposed and promulgated in the sacred canons and other constitutions, general and particular, against such delinquents. From which we are content that you be absolved, provided that first, with a sincere heart, and unfeigned faith, you abjure, curse, and detest the aforesaid errors and

heresies, and every other error and heresy contrary to the Catholic and Apostolic Roman Church in the form to be prescribed by us.

And in order that this your grave and pernicious error and transgression may not remain altogether unpunished, and that you may be more cautious for the future, and an example to others, that they may abstain from similar delinquencies—we ordain that the book of the "*Dialogues of Galileo Galilei*" be prohibited by public edict.

We condemn you to the formal prison of this Holy Office during our pleasure, and by way of salutary penance, we enjoin that for three years to come you repeat once a week the seven penitential Psalms.

Reserving to ourselves full liberty to moderate, commute, or take off, in whole or in part, the aforesaid penalties and penance.

And so we say, pronounce, sentence, declare, ordain, condemn and reserve, in this and any other better way and form which we can and may lawfully employ.

So we the undersigned Cardinals pronounce.

F. Cardinalis de Asculo.
G. Cardinalis Bentiuolus.
Fr. Cardinalis de Cremona.
Fr. Antonius Cardinalis S. Honuphrij.
B. Cardinalis Gypsius.
Fr. Cardinalis Verospius.
M. Cardinalis Ginettus.[1]

Before proceeding to narrate the consequences of this sentence to the culprit (namely, his recantation and punishment), this seems to be the place to subject this memorable document to a critical review, to show how far the sentence pronounced on Galileo had a legal basis, even on Romish principles. To this end it will be necessary to follow the construction of the sentences step by step, for only in this way can a correct opinion be formed of the accordance of this cunningly devised structure with the actual state of things.

The sentence begins with a condensed historical review of the transactions of 1615, obviously based on the denunciations of Lorini, and the evidence of Caccini of 20th March, 1615. Immediately afterwards follows the well-known opinion of the theological Qualifiers on the principles of Copernicus.

[1] Appendix VI.

This is plainly to justify the measures taken in consequence by the ecclesiastical authorities against his doctrine and its most distinguished advocate. For immediately after follows, first a recapitulation of the report registered in the Vatican MS. of the events of 25th and 26th February, 1616, and then the decree of the Congregation of the Index of 5th March, 1616, "by which those books were prohibited which treat of the aforesaid doctrine, and the same was declared to be false and entirely contrary to Holy and Divine Scripture." The sentence then comes to the occasion of the trial of Galileo, namely, his "Dialogues,"—and states: firstly, that by this book he had transgressed the special prohibition of 1616;[1] secondly, that his statement therein, which is almost incredible, that he had left the Copernican view undecided and as only *probable*, is a "gross error," since a doctrine cannot in any way be probable (*probalis*) which has already been found and declared to be "contrary to Holy Scripture."

The first point, from the standpoint of the Inquisition, which treated the note of 26th February, 1616, as an authentic document, is certainly correct; the second, even according to the maxims of Rome, is not to the purpose. According to these maxims a proposition can only be made into a dogma by "infallible" authority, namely, by the Pope speaking *ex cathedra*, or by an Œcumenical Council; and on the other hand, it is only by the same method that an obligation can be laid upon the faithful to consider an opinion heretical. But a decree of the Congregation of the Index does not entail the

[1] It is very remarkable that Jagemann, in his book on Galileo, which appeared in 1784 (New Ed. 1787, pp. 86, 95), doubts the fact of such a special prohibition. Of course he is acquainted only with the sentence published by Riccioli, and surmises that he invented the passage in which the special prohibition is mentioned, "in order to justify the harsh proceedings of the Court of Rome under Urban VIII." So that ninety years ago, without anything to go by but the wording of the sentence, Jagemann suspected that this strict prohibition was never issued to Galileo, and says,—"Neither does this decree agree with the information given above on all points," *i.e.*, in letters of Galileo and Guiccardini of 1616.

obligation; for, although by virtue of the authority conferred on it, it can enforce obedience and inflict punishment, its decrees are not "infallible." They can, however, be made so, according to ecclesiastical views, either by the subsequent express confirmation of the Pope by a brief in his name, as supreme head of the Christian Catholic Church; or by the decree of the Congregation being originally provided with the clause: "*Sanctissimus confirmavit et publicari mandavit.*" But the decree of 5th March, 1616, is neither confirmed by a subsequent brief, nor does it contain that special formula; and, therefore, in spite of this decree, which declared the opinion of Copernicus to be "false and contrary to Holy and Divine Scripture," it might still be considered as undecided, and even probable, because the decree might be fallible, and did not entail the obligation to adopt its sentence as an article of faith.[1] This must also have been the view of the ecclesi-

[1] Compare the excellent essay: "La Condemnation de Galilée. Lapsus des ecrivains qui l'opposent à la doctrine de l'infallibilité du Pape," von Abbé Bouix. Also Pieralisi, pp. 121–131; and Gilbert's "La Procés de Galilée," pp. 19–30. We may remark here, that according to these principles the doctrine of Copernicus was not made heretical by the sentence of the Inquisition, because the decree never received the Pope's official ratification. To confirm this statement we subjoin some remarks by theological authorities. Gassendi remarks in his great work, "De motu impresso a motore translato" (Epist. ii. t. iii. p. 519), published nine years after the condemnation of Galileo, on the absence of the papal ratification in the sentence of the Holy Tribunal, and that therefore *the negation of the Copernican theory was not an article of faith.* As a good priest he recognises the high authority of a decision of the Congregation, and subjects his personal opinions to it. Father Riccioli, in his comprehensive work, "Almagestum novum," published nine years after Gassendi's, reproduces Gassendi's statement word for word (t. i., pars. 2, p. 489), and entirely concurs in it, even in the book which was meant to refute the Copernican theory at all points (pp. 495, 496, and 500). Father Fabri, a French Jesuit, afterwards Grand Penitentiary at Rome, says in a dissertation published there in 1661 against the "Systema Saturnium," of Huyghens (p. 49), that as no valid evidence can be adduced for the truth of the new system, the authorities of the Church are quite right in interpreting the passages of Holy Scripture relating to the system of the universe literally; "but," he adds, "if ever

astical authorities of the censorship, who had given Galileo's book the *imprimatur*, and thereby, as H. Martin justly remarks,[1] relieved the author of responsibility, not in anything relating to the assumed special prohibition, but concerning the accordance of the work with the published decree. Point 2, therefore, seems as unjustifiable as it is untenable. The sentence now gives a brief *resumé* of the confessions made by Galileo during the examination, which are employed to confirm his guilt. The twofold reproach is urged against him, as of special weight, that he began to write his "Dialogues" after the issue of the assumed prohibition, and that he said nothing about it in obtaining the *imprimatur* of the censors; thus the special prohibition was treated as an established fact —on the one hand, his disobedience to an injunction of the ecclesiastical authorities was proved, and on the other, the *imprimatur* was obtained on false pretences, and was null and void.

any conclusive reasons are discovered (which I do not expect), *I do not doubt that the Church will say that they are to be taken figuratively*," a remark which no priest would have made about a doctrine pronounced heretical by infallible authority. Caramuel, a Spanish Benedictine, who also discussed the future of the Copernican theory, defines the position still more clearly than Fabri. In his "Theologia fundamentalis," published at Lyons in 1676 (t. i., pp. 104–110), after defending the decree and sentence of the Congregation, he discusses the attitude which the Church will take in case the system should prove indisputably true. In the first place he believes this will never happen, and if it does, *it could never be said that the Church of Rome had been in error, as the doctrine of the double motion of the earth had never been condemned by an Œcumenical Council, nor by the Pope speaking ex cathedra, but only by the tribunal of cardinals.*

It is interesting to find that Descartes, Galileo's contemporary, put the same construction on the matter. He wrote on 10th January, 1634, to Father Mersenne: "*As I do not see that this censure has been confirmed either by a Council or the Pope, but proceeds solely from the congregation of the cardinals*, I do not give up hope that it will not happen to the Copernican theory as it did to that about the antipodes, which was formerly condemned in the same way." (Panthéon littéraire, Œuvres philosophiques de Descartes, p. 545.)

[1] Page 141.

After a rather weak recapitulation of the declaration so unedifying to posterity, made by Galileo at his second hearing, the sentence proceeds to the discussion of an authentic document which formed the chief defence of the accused: the certificate given him in 1616 by Cardinal Bellarmine. The authors of the sentence had at this point a delicate and difficult task to perform. The object was to uphold the inviolability of the "note" of 26th February, 1616—this main support of the whole indictment—and by no means to make this attestation appear at variance with the actual circumstances, or it would have become an important argument in favour of the accused. Nay, to avoid this rock, material for the accusation had to be found in the words of the certificate itself. And thus we find this document, which, as Wohlwill pertinently remarks,[1] by the words "but only" directly denies the assumed stringent prohibition of 1616, singularly enough, thanks to the sophistry of the Roman lawyers, forming a weighty argument in the sentence for the Inquisitors: "But this certificate," it says, "produced by you in your defence, has only aggravated your delinquency; since although it is there stated that the said opinion is contrary to Holy Scripture, you have nevertheless dared to discuss and defend it, and to argue its probability."

But as here they again had to refer to the protecting *imprimatur* of the ecclesiastical censors, they hasten to add: "nor does the licence, artfully and cunningly extorted by you, avail you anything, since you did not notify the command imposed upon you."

One cannot help drawing the conclusion, that if the attestation of Cardinal Bellarmine is accepted as true, "the command imposed" did not exist, and of course could not be communicated by Galileo to the censors.

In the clause of the sentence referring to the attestation, a passage is dexterously interwoven, which ascribes the decree of 5th March, 1616, to the Pope; while, as we know,

[1] Page 60.

it belongs officially to the Congregation alone. The words are these: "But merely that the declaration made by his Holiness (*fatta da nostro Signore*), and published by the Holy Congregation of the Index, had been announced to you."

Undoubtedly Pope Paul V. wished the decree made and privately instigated it, as Urban VIII. did the sentence against Galileo; and in this sense the former may be attributed to the one and the latter to the other, and the condemnation of the Copernican theory to both. But in this they acted as private persons, and as such they were not (nor would they now be), according to theological rules, "infallible." The conditions which would have made the decree of the Congregation, or the sentence against Galileo, of dogmatic importance, were, as we have seen, wholly wanting. Both Popes had been too cautious to endanger this highest privilege of the papacy by involving their infallible authority in the decision of a scientific controversy; they therefore refrained from conferring their sanction, as heads of the Roman Catholic Church, on the measures taken, at their instigation, by the Congregation "to suppress the doctrine of the revolution of the earth." Thanks to this sagacious foresight, Roman Catholic posterity can say to this day, that Paul V. and Urban VIII. were in error "as men" about the Copernican system, but not "as Popes." For us there remains the singular deduction, that the sentence on Galileo rests again and again, even on the principles of the ecclesiastical court itself, on an illegal foundation.

After a brief mention of the rigid examination of 21st June, the sentence comes to formulate the judgment more particularly. According to this Galileo is, (1) "in the judgment of this Holy Office, vehemently suspected of heresy, namely, of having believed and held the doctrine which is false and contrary to the Sacred and Divine Scriptures . . . and that an opinion may be held and defended as probable

after it has been declared and defined to be contrary to Holy Scripture;" (2) and that consequently he has incurred all the censures and penalties imposed in the sacred canons against such delinquents. "From which we are content that you be absolved, provided that first you abjure, curse, and detest the aforesaid errors and heresies in the form to be supplied by us."

Point 1, according to Romish regulations about making an opinion an article of faith, in its relation to heresy appears to be illegal and incorrect. Galileo had not laid himself open to suspicion of heresy because he had inclined to a doctrine discovered to be contrary to Scripture by the fallible Congregation of the Index. Point 2 must also, therefore, be illegal, which says that Galileo had "consequently" incurred all the censures and penalties adjudged to such criminals by the canon law.

Galileo could never have been legally condemned on suspicion of heresy from his "Dialogues." In the first place, because neither he nor any other Catholic was bound by the decree of 5th March, 1616, to regard the confirmation of the old system or the rejection of the new as an article of faith; in the second place, because the *imprimatur* of the ecclesiastical authorities relieved him from all responsibility. But he could be condemned for disobedience to the assumed special prohibition of 26th February, 1616. In the sentence this forms the only legal basis of the indictment and condemnation. How far this prohibition is historically credible, we think we have sufficiently demonstrated in the course of our work.

And when we consider the penalties which follow from this sentence, based partly upon incorrect, and partly upon false accusations, we find that the Inquisition, by compelling Galileo to recant with a threat of other and severer penalties, *far exceeded its powers.* The Holy Tribunal was empowered to punish the "disobedience" of the philosopher with imprisonment and ecclesiastical penances, and to forbid him to

discuss the opinion in writing or speaking, but it had no authority to extort from Galileo, or any one else, such a confession on an opinion which had not been defined by "infallible" authority.

This is openly admitted even by high theological authority: "*In fact an excess of authority and an injustice did take place;*" "but," the reverend gentleman hastens to add, "certainly not from malice, but from a mistake,"[1]—a lenient opinion which we are unable to share.

Whether any scruples were expressed, or any dissentient voices heard in this ecclesiastical court about the manifold illegalities in the proceedings against the famous accused, we do not know, no notes having come down to us of the private discussions and transactions of the Holy Tribunal. But there is one fact which leads us to conclude that all the judges did not consent to this procedure, and that the sentence was not unanimous: *at the head of the sentence ten Cardinals are enumerated as judges, but the document is signed by seven only, and besides this there is the express remark: "So we, the undersigned cardinals, pronounce"*! Singularly enough, two hundred and thirty-one years passed by, during which much that is valuable was written about Galileo, and a great deal more that was fabulous, before this significant circumstance was noticed by any author. The merit of having first called attention to it belongs to Professor Moritz Cantor, in 1864.[2] The three cardinals who did not sign were, Caspar Borgia, Laudivio Zacchia, and Francesco Barberini, the Pope's nephew, whom we have repeatedly found to be a warm patron and protector of Galileo.

Professor Berti offers as an explanation of the absence of the three signatures, that the Congregation in the name of which the sentence was passed consisted of ten members, but that at the last sitting seven only were present, so that seven only could sign, and adds, as it appears to us unwarrantably,

[1] Abbé Bouix, p. 229.

[2] *Zeitschrift für Math. und Physik.* 9th series. Part 3, pp. 194, 195.

"that it by no means follows that the three absentees were of a contrary opinion."[1]

Pieralisi does not find the matter so simple, and devotes seven large pages to account for the absence of the three prelates from the Congregation. "Cardinal Borgia," he says, "was on very bad terms with Urban VIII., because he had addressed the Pope in a loud voice in a consistory, and the Pope had imperiously told him to be quiet and to go away."[2] But it has been proved that even after this scene the cardinal appeared at the consistories up to 12th February, 1635, although there were complaints that he took walks in Rome instead of attending the sittings of the Propaganda and the Holy Office. But it is not likely that this cardinal, whose name stands at the head of the sentence, would have absented himself from the final sitting without some good reason. Pieralisi thinks that he was more friendly to Galileo than the other cardinals, an opinion for which there is no evidence and which proves nothing. Even Pieralisi confesses that he can find no reason for the absence of Cardinal Zacchia, but assigns the following motive for that of Cardinal Francesco Barberini: "He probably wished to uphold the right enjoyed by the cardinal nephews, and afterwards by the secretaries of state, of sometimes abstaining from voting in order to reserve to themselves greater freedom in the treatment of public, private, and political affairs." The insufficiency of this explanation is too obvious to need comment. Pieralisi himself comes to the conclusion that these dignitaries did not wish to append their signatures to the famous sentence, which is much the same thing as the conjecture that they did not agree to it.

In accordance with this sentence, certainly not passed

[1] "I Cardinale Inquisitori componenti la Congregazione, in cui nome la sentenza è fatta, erano in numero di dieci. Nell' ultima Congregazione se ne trovarono presenti solo sette; quindi sette solo sono sottoscritti. Da cio non può in nessuna maniera desumersi che i tre mancanti fossero di parere contrario." ("Processo originale," etc., p. 149, note 1.)

[2] "Urbano VIII. e Galileo Galilei," pp. 218-224.

unanimously by the members of the Holy Tribunal, which forms one of the foulest blots in the melancholy annals of the Inquisition, Galileo was compelled immediately after hearing it to make the following degrading recantation, humbly kneeling, before the whole assembly :—

"I, Galileo Galilei, son of the late Vincenzo Galilei, Florentine, aged seventy years, arraigned personally before this tribunal, and kneeling before you, most Eminent and Reverend Lord Cardinals, Inquisitors general against heretical depravity throughout the whole Christian Republic, having before my eyes and touching with my hands, the holy Gospels—swear that I have always believed, do now believe, and by God's help will for the future believe, all that is held, preached, and taught by the Holy Catholic and Apostolic Roman Church. But whereas —after an injunction had been judicially intimated to me by this Holy Office, to the effect that I must altogether abandon the false opinion that the sun is the centre of the world and immovable, and that the earth is not the centre of the world, and moves, and that I must not hold, defend, or teach in any way whatsoever, verbally or in writing, the said doctrine, and after it had been notified to me that the said doctrine was contrary to Holy Scripture—I wrote and printed a book in which I discuss this doctrine already condemned, and adduce arguments of great cogency in its favour, without presenting any solution of these ; and for this cause I have been pronounced by the Holy Office to be vehemently suspected of heresy, that is to say, of having held and believed that the sun is the centre of the world and immovable, and that the earth is not the centre and moves :—

Therefore, desiring to remove from the minds of your Eminences, and of all faithful Christians, this strong suspicion, reasonably conceived against me, with sincere heart and unfeigned faith I abjure, curse, and detest the aforesaid errors and heresies, and generally every other error and sect whatsoever contrary to the said Holy Church ; and I swear that in future I will never again say or assert, verbally or in writing, anything that might furnish occasion for a similar suspicion regarding me ; but that should I know any heretic, or person suspected of heresy, I will denounce him to this Holy Office, or to the Inquisitor and ordinary of the place where I may be. Further, I swear and promise to fulfil and observe in their integrity all penances that have been, or that shall be, imposed upon me by this Holy Office. And, in the event of my contravening, (which God forbid !) any of these my promises, protestations, and oaths, I submit myself to all the pains and penalties imposed and promulgated in the sacred canons and other constitutions, general and particular, against such delinquents. So help me God, and these His holy Gospels, which I touch with my hands.

I, the said Galileo Galilei, have abjured, sworn, promised, and bound

myself as above; and in witness of the truth thereof I have with my own hand subscribed the present document of my abjuration, and recited it word for word at Rome, in the Convent of Minerva, this twenty-second day of June, 1633.

I, Galileo Galilei, have abjured as above with my own hand."[1]

Certain Catholic writers express the hope, at the expense of truth, for the sake of Galileo's salvation and honour, that he really had, from conviction, renounced the opinion which he had been labouring for and advocating up to old age. Indeed, the super-Catholic author of an essay, called "The Holy See against Galileo Galilei and the Astronomical System of Copernicus,"[2] does not hesitate to say: "Probably the physical absurdities of his (Galileo's) doctrine had achieved a victory for the voice of reason and religion."[3] Undoubtedly there were many physical difficulties in the way of a general acceptance of the new doctrines (especially the prevailing incorrect ideas about the specific gravity of the air),[4] and they were only finally overcome by the discovery of the law of gravitation by the genius of Newton; but they were not so great as to prevent men, like Kepler, Descartes, Gassendi, Diodati, Philip Landsberg, Joachim Rhäticus, and others, and above all, the great Italian reformer of physics and astronomy, from, even at that time, recognising the truth of the new theory. It does not appear, either, that the author of that article had much faith in his own conjecture, for he proceeds to a demonstration, from opposite premises, which was for a time much in vogue with the Jesuitical defenders

[1] Appendix VI.

[2] Vol. vii. of the "Historisch-politischen Blätter für das Catholische Deutschland." Munich, 1841.

[3] Ibid. p. 578.

[4] The reproach which the apologists of the Inquisition are fond of bringing against Galileo, that he knew nothing about the specific gravity of the air, is incorrect, as appears from his letter to Baliani of 12th March, 1613 (published for the first time in 1864 by Signor Giuseppe Sacchi, director of the library at Brera, where the autograph letter is to be seen), in which Galileo describes a method he had invented for determining the specific gravity of the air.

of the Inquisition against Galileo, and which must therefore be briefly mentioned.

This was nothing less than an attempt to show that even if Galileo held the Copernican system to be the only true one, he could, thanks to the wording of the formula of recantation, utter it without doing violence to his conscience; or, what is now known to be truth.[1] Galileo swore that he never had believed and never would believe (1) "that the sun was the centre of the earth and immovable." That he could easily do, says our author, for, in relation to the fixed stars, the sun by no means forms the centre; and heavy bodies on the earth fall towards its centre and not towards the sun, which, also, in this sense, was not the centre! There was no difficulty for Galileo in recanting that the sun was immovable, for he had himself concluded from the motion of the spots that it revolved on its own axis.[2] As to the earth, he abjured it as an error (2) that "the earth is not the centre;" quite right, for it is the centre for heavy bodies: and it was not said —"the centre of the universe;" (3) "that the earth moves;" vast efforts of sophistry were necessary to make this desperately precise proposition square with the arguments of this curious casuist. He therefore says, that as, according to the wording, it is not the diurnal motion of the earth that is in question, this proposition has quite a different meaning, in which, on the one hand, it must be said that the earth is immovable, and on the other, that it is only motion through the air from one place to another that is excluded. The earth may certainly, both in relation to its physical conformation and in contrast to what goes on upon it, be called immovable![3] At the time when these lines were written, in 1875, the author of this article in the "Historisch-politischen Blättern" was unknown to us. Afterwards, through the liberality of the Bavarian Government, among other works relating to Galileo

[1] See the essay before mentioned, p. 583.
[2] Ibid. pp. 580, 581.
[3] Ibid. pp. 581, 582.

in the Royal Library, the following were lent to us:— (1) "Di Copernico e di Galileo, scritto postumo del P. Maurizio-Benedetto Olivieri, Ex. generale dei domenicani e Commissario della S. Rom. ed Univ. Inquisizione ora per la prima volta messo in luce sull' autografo per cura d'un religioso dello stesso istituto. Bologna, 1872"; (2) "Il S. Officio, Copernico e Galileo a proposito di un opusculo postumo del P. Olivieri sullo stesso argomento apunti di Gilberto Govi. Torino, 1872." To our no small surprise we found, on reading the former, that it had by no means "seen the light" for the first time in 1872, but had appeared thirty-one years before in a literal German translation, as the article above mentioned in the "Historisch-politischen Blättern," with a few insignificant alterations, and a different title, the old one being given in a note. Neither the editor of the first Italian work of Olivieri, the Dominican monk, Fra. Tommaso Bonora, nor the author of the above rejoinder,[1] Gilberto Govi, had, as appears from what they say, the least idea of this singular fact. In Germany, Professor Clemens of Bonn, was universally believed to be the author of this article, which excited great attention; so firmly was it held, that Professor Moritz Cantor, in a notice of the present work, gave no credence to our discovery, but stated in his critique, "The anonymous writer was not Olivieri, but Professor Clemens of Bonn."[2] Upon this we sent Professor Cantor the essay from the "Historisch-politischen Blättern" and Bonora's work for examination, when he was constrained to be convinced by the sight of his own eyes.

The wretched attempt thus to clear the Inquisition, by

[1] It carefully refutes the assertion made by Father Olivieri, that the Holy Office had prohibited the Copernican doctrine from being demonstrated as true, and condemned its famous advocate, Galileo, because it could not then be satisfactorily proved scientifically, and Galileo had supported it with arguments scientifically incorrect. If we can believe the ex-general of the Dominicans, the Inquisition in 1616 and 1633 was only the careful guardian of science!

[2] *Augsburger Allgemeine Zeitung, Beilage*, No. 93, 2nd Aug., 1876.

Olivieri's method, of the reproach of having extorted an oath from Galileo entirely against his convictions, is unworthy of refutation. By impartial posterity the oath is and must be regarded as perjury, and is all the more repulsive because the promise was coupled with it that, "if he met with a heretic, or person suspected of heresy," he would denounce him to the authorities of the Church; that is, the master would denounce his disciples—for by a "heretic, or any one suspected of heresy," the adherents of the Copernican system must be chiefly understood—to the persecution of the Inquisition! The taking of this degrading oath may, under the circumstances, be excused, but it never can be justified.

After this painful act of world-wide interest had been completed, Galileo was conducted back to the buildings of the Holy Office. Now that he and the Copernican system had been condemned with becoming solemnity by the Holy Office, Urban VIII. magnanimously gave the word for mercy; that is, Galileo was not, as the sentence prescribed, detained in the prisons of the Inquisition, but a restricted amount of liberty was granted him. The Roman curia never entirely let go its hold upon him as long as he lived. On the day after the sentence was passed, the Pope exchanged imprisonment for temporary banishment, to the villa of the Grand Duke of Tuscany at Trinita de' Monti, near Rome,[1] whither Niccolini conducted his unfortunate friend on the evening of 24th June, as we find from the despatch before quoted from him to Cioli of 26th of the month.[2]

We learn from the same source that while Galileo took the prohibition of his book, of which he was aware beforehand, with tolerable composure, the unexpected proceedings of the Holy Office against him personally, affected him most deeply. Niccolini did his best to rouse him from his deep depression, but at first with little success.[3] Galileo longed

[1] Gherardi's Documents, Doc. xv.

[2] Compare p. 228, note 3.

[3] Niccolini's despatch to Cioli, 3rd July, 1633. (Op. ix. p. 445.)

to leave Rome, where he had suffered so much, and therefore addressed the following petition to Urban VIII. :—

"Most Holy Father! Galileo Galilei most humbly begs your Holiness to exchange the place assigned to him for his prison near Rome, for some other in Florence, which may appear suitable to your Holiness, in consideration of his poor health, and also because the petitioner is expecting a sister with eight children from Germany, to whom no one can afford help and protection so well as himself. He will receive any disposition of your Holiness as a great favour."[1]

But in the Vatican the opinion prevailed that to allow Galileo to return to Florence already would be a superfluity of indulgence. The Pope said to Niccolini: "We must proceed gently, and only rehabilitate Galileo by degrees."[2] Still Urban was disposed to grant the ambassador's request, and to alter the penalty so far as to allow the exile to go to Siena, to the house of the Archbishop Ascanio Piccolomini, whom we know as a warm friend of Galileo's. Niccolini's urgent entreaties succeeded in obtaining a papal decree of 30th June, ordering Galileo to go by the shortest route to Siena, to go to the Archbishop's at once, to remain there, and strictly to obey his orders; and he was not to leave that city without permission from the Congregation.[3] Galileo was informed of this decree on 2nd July by the Commissary-General of the Inquisition, Father Vincenzo Maccolani di Firenzuola, in person.[4] On 10th July, Niccolini reported to Cioli: "Signor Galileo set out early on Wednesday, 6th July, in good health, for Siena, and writes to me from Viterbo, that he had performed four miles on foot, the weather being very cool.[5]

[1] Vat. MS. fol. 453 ro.
[2] Niccolini's despatch to Cioli of 3rd July.
[3] Vat. MS. fol. 453 ro. and 454 vo.
[4] Ibid. fol. 453 vo.
[5] Op. ix. p. 447.

CHAPTER X.

CURRENT MYTHS.

Popular Story of Galileo's Fate.—His Eyes put out.—"E pur si Muove."—The Hair Shirt.—Imprisonment.—Galileo only detained twenty-two Days at the Holy Office.—Torture.—Refuted in 18th Century.—Torture based on the words, "*examen rigorosum.*"—This shown to be untenable.—Assertion that the Acts have been falsified refuted.—False Imputation on Niccolini.—Conclusive Evidence against Torture.—Galileo not truly a "Martyr of Science."

BEFORE following Galileo's fate to the end, so far as his relations with the curia are concerned, it seems desirable to glance at the fables and exaggerations, mostly originating in malice and fierce partisanship, which, in defiance of the results of the latest historical research, are not only circulated among the public at large, but introduced, to some extent, even in works which profess to contain history.

According to these legends, Galileo languishes during the trial in the prisons of the Inquisition; when brought before his judges, he proudly defends the doctrine of the double motion; he is then seized by the executioners of the Holy Office, and subjected to the horrors of torture; but even then—as heroic fable demands—he for a long time remains steadfast; under pain beyond endurance he promises obedience, that is, the recantation of the Copernican system. As soon as his torn and dislocated limbs permit, he is dragged before the large assembly of the Congregation, and there, kneeling in the penitential shirt, with fierce rage in his heart, he utters the desired recantation. As he rises he is no longer able to master his indignation,

and fiercely stamping with his foot, he utters the famous words: "E pur si muove!" He is, therefore, thrown into the dank dungeons of the dreaded tribunal, where his eyes are put out!

The blinding of Galileo is a creation of the lively popular mind, which, with its love of horrors, embellishes tragical historical events by fictitious additions of this kind, just suited to the palates of people accustomed to coarse diet. Galileo's subsequent loss of sight may have given rise to the fable, which first appeared in the "History of Astronomy" by Estevius.[1] It is not known who was the inventor of the assumed exclamation, "E pur si muove," which sounds well, and has become a "winged word;" but besides not being historic, it very incorrectly indicates the old man's state of mind; for he was morally completely crushed. Professor Heis, who has devoted a treatise to the origin of this famous saying, thinks that he has discovered its first appearance in the "Dictionnaire Historique," Caen, 1789;[2] Professor Grisar tells us, however, in his studies on the trial of Galileo, that in the "Lehrbuch der philosophischen Geschichte," published at Würzburg, 1774, fifteen years earlier, by Fr. N. Steinacher, the following edifying passage occurs:—

"Galileo was neither sufficiently in earnest nor steadfast with his recantation; for the moment he rose up, when his conscience told him that he had sworn falsely, he cast his eyes on the ground, stamped with his foot, and exclaimed, 'E pur si muove.'"[3]

Besides the fact that these words are not attributed to Galileo by any of his contemporaries, not even the best

[1] Fabroni, "Vitæ Italorum." Pisa, 1778, vol. i. p. 144.

[2] Heis, "Das Unhistorische des dem Galilei in dem Munde gelegten: 'E pur si muove.'" Munich, 1868.

[3] "Der Galileischen Process auf Grund der neuesten Actenpublicationen historisch und juristisch geprütf." Von Prof. H. Grisar, S. J. *Zeitschrift für Kathol. Theologie.* 2nd series. Innsbrück, 1878.

informed, the fallacy of the whole story is obvious; for the witnesses of this outbreak, his judges, in fact, would assuredly not have allowed so audacious a revocation of his recantation to escape unpunished; it is, indeed, impossible to conjecture what the consequences would have been; the recusant would certainly not have been released two days afterwards from the buildings of the Holy Office.

Although this dramatic scene is not mentioned as worthy of credit by any modern historian,[1] it is different with the hair shirt in which Galileo is said to have performed the humiliating act. Libri, Cousin, Parchappe, and very recently Louis Combes,[2] all gravely relate that the philosopher had to recant "en chemise."

The official document, although it goes very much into detail as to the way in which the oath was performed, says nothing of the shirt, and these authors should have said nothing either. The doubtful source in which this fable originated is an anonymous and very confused note on a MS. in the Magliabechiana Library at Florence, where among other nonsense we find: "the poor man (Galileo), appeared clad in a ragged shirt, so that it was really pitiable."[3] We agree with Epinois,[4] that history requires more authentic testimony than that of an anonymous note.

[1] Ferry, author of the article "Galilée" in "Dictionnaire de Conversation," Paris, 1859, undoubtedly believes the story. But the man who makes Galileo be born at Florence, study at Venice, and become Professor at Padua directly afterwards, thinks that Galileo did nothing more for science after his condemnation, and that (in 1859) his works were still on the Index, can hardly be reckoned among historians.

[2] Louis Combes's "Gal. et L'Inquisition Romaine," Paris, 1876, is a pamphlet of no scientific value whatever, distinguished by astounding ignorance of the Galileo literature. The author complains that the original documents relating to the trial are buried among the secret papal archives, and that nothing more is known of them than what Mgr. Marini has thought fit to communicate! The publication, then, of the most important documents of the Vat. MS., by Epinois, 1867, seems to have escaped the notice of M. Louis Combes!

[3] Nelli, vol. ii. p. 562, note 2.

[4] Page 69, note 2.

But upon what testimony, then, do a large number of authors speak with much pathos of the imprisonment which Galileo had to undergo? No sort of documents are referred to as evidence of the story; this is quite intelligible, for none exist. Or is the rhetorical phrase, "Galileus nunc in vinculis detinetur,"[1] contained in a letter of May, 1633, from Rome, from Holstein to Peiresc, to be taken as evidence that Galileo was really languishing in the prisons of the Inquisition? One glance at the truest historical source for the famous trial,—the official despatches of Niccolini to Cioli, from 15th August, 1632, to 3rd December, 1633, from which we have so freely quoted,—would have convinced any one that Galileo spent altogether only twenty-two days (12–30th April, and afterwards 21–24th June, 1633) in the buildings of the Holy Office; and even then, not in a prison cell with grated windows, but in the handsome and commodious apartment of an official of the Inquisition. But such writers do not seem to have been in the habit of studying authorities; thus, for example, in the "Histoire des Hérésies," by P. Domenico Bernini, and in the "Grande Dictionnaire Bibliographique" of Moreri, we find it stated that Galileo was imprisoned five or six years at Rome! Monteula, in his "Histoire des Mathematiques," and Sir David Brewster, in his "Martyrs of Science," reduce the period, perhaps from pity for the poor "martyr," to one year; Delambre, however, felt no such compassion, and says in his "Histoire de l'Astronomie Ancienne," that Galileo was condemned to an imprisonment which lasted "several years"! Such an error is the more suprising from the last celebrated author, as we know that trustworthy extracts from the original acts of the Vatican MS. were in his hands.[2] Even in a very recent work, Drager's "Geschichte der Conflicte zwischen Religion und Wissenschaft," Leipzig, 1875 ("History of the Conflicts between

[1] Venturi, vol. ii. p. 182; Nelli, vol. ii. p. 537.

[2] See Appendix: History of the Vat. MS.

Religion and Science"), it is seriously stated that Galileo was detained three years in the prisons of the Inquisition!

Thus we see that the fable of Galileo's imprisonment has been adopted by several authors without any historical foundation, and this is to a far greater extent the case with the famous story of the torture to which he is said to have been subjected. As it has held its ground, although only sporadically, even up to the most recent times,[1] it seems incumbent on us to go more deeply into this disputed question.

Curiously enough, it is towards the end of the eighteenth century that we find the first traces of this falsehood, and from the fact that three *savans*, Frisi,[2] Brenna,[3] and Targioni,[4] who wrote lives of Galileo at that time, raised a protest against it. Although they were not then able, as we are now, to base their arguments upon the Acts of the trial, they had even then authentic materials in their hands —the despatches between Niccolini and Cioli,[5] then recently published by Fabroni—which rendered it utterly improbable that the old man had been placed upon the rack. These materials were thoroughly turned to account eighty years later by T. B. Biot, in his essay, "La verité sur le procès de Galilei."[6] He clearly showed from the reports of the ambassador that Galileo had neither suffered torture during his first stay in the buildings of the Holy Office, from 12–30th April, when he daily wrote to Niccolini,[7] and was in better health when he returned to the embassy than when he left it;[8] nor during the three days of his second

[1] See Dr. Emil Wohlwill's "Ist Galileo gefoltert worden." Leipzig, 1877.
[2] "Elogio del Galilei." Livorno, 1775.
[3] In Fabroni, "Vitæ Italorum," i.
[4] "Notizie degli aggrandimenti delle scienze fosiche in Toscana." i. Firenze, 1780.
[5] "Lettere inedite di uomini illustri." Firenze, 1773–75.
[6] *Journal des Savans:* July, Aug., Sep., Oct., 1858.
[7] Niccolini's despatch to Cioli, 25th April. (Op. ix. p. 441.)
[8] Niccolini to Cioli, 3rd May. (Op. ix. p. 442.)

detention, from 21–24th June, at the end of which he was conducted by Niccolini, on the evening of the 24th, to the Villa Medici.[1] On 6th July he set out thence, "in very good health," for Siena, and in spite of his advanced age performed four miles on foot for his own pleasure,[2] which an infirm old man of seventy, if he had suffered torture a fortnight before, would surely not have been able to do.

But all these plain indications go for nothing with some historians, whose judgment is warped by partisanship, and who are not willing to give up the notion that Galileo did suffer the pangs of torture. And so we find this myth, at first mentioned by a few authors as a mere unauthentic report, assuming a more and more distinct form, until it is brought forward, with acute and learned arguments, as, to say the least, very probable, by Libri, Brewster, Parchappe, Eckert, and others.

These writers base their assertion on the following passage in the sentence :—

"And whereas it appeared to us that you had not stated the full truth with regard to your intention, we thought it necessary to subject you to a rigorous examination (*examen rigorosum*), at which (without prejudice however, to the matters confessed by you, and set forth as above with regard to your said intention) you answered like a good Catholic."

These writers assert, on the one hand, that the expression "*examen rigorosum*," in the vocabulary of the Inquisition could mean nothing but torture; and on the other, they take the expression that Galileo had "answered as a good Catholic" under *examen rigorosum*, to mean that they had extorted from him a confession as to his intention, and conclude that torture had been resorted to. But on closer scrutiny of the wording of the passage, the meaning appears to be exactly the contrary; for the sentence in parenthesis says plainly that Galileo had "answered as a good Catholic"

[1] Niccolini to Cioli, 26th June. (Op. ix. pp. 444, 445.)
[2] Niccolini to Cioli, 10th July. (Ibid. p. 447.)

"*without prejudice*" to his previous depositions or the conclusions which his judges had previously arrived at as to his intention, and which Galileo persistently denied. His Catholic answer consisted in his repeated assurance that he did not hold the opinion of Copernicus, and had not held it after the command to renounce it had been intimated to him. The Inquisition could but call this a Catholic answer, as Galileo thereby entirely renounced the condemned doctrine.[1]

We turn now to the other assertion of these writers, that "*examen rigorosum*" means torture. This is in a general sense correct, if by torture the actual application of it is not intended. But they take the passage in the sentence for decisive evidence that torture was actually carried out, in which they are mistaken, as the following passage from the "Sacro Arsenale" undoubtedly proves: "If the culprit who was merely taken to the torture chamber, and there undressed, or also bound, without however being lifted up, confessed, it was said that he had confessed under torture and under *examen rigorosum*."[2] The last expression then by no means always implies the actual application of torture. Dr. Wohlwill knows this passage, and the sentence therefore only proves to him that Galileo was taken into the torture chamber; what took place there, whether the old man was actually tortured, or whether they contented themselves with urging him to speak the truth, and threatening him with the instruments they were showing him (a degree of torture called *territio realis*), appears shrouded in mystery to Dr. Wohlwill. In spite of his acquaintance with the literature of the Inquisition, he has fallen into a mistake. He thinks that

[1] Even Wohlwill allows, p. 29, that the opinion that "Catholic answer" means answer under torture is not tenable.

[2] "Il Reo, che solamente condotto al luogo della tortura ò quivi spogliato, ò pur anco legato senza però esser alzato, confessa dicesi haver confessato ne' tormenti, e nell' esamina rigorosa." ("Sacro Arsenale overo Prattica dell' Officio della Santa Inquisitione." Bologna, 1865, Mesini's ed. p. 412.)

the *territio realis* was the first degree of torture.[1] But this was not the case. Limborch's work, "Historia Inquisitionis," with which Wohwill does not seem to be acquainted, contains definite information on the point. He says that there were five grades of torture, which followed in regular order, and quotes the following passage verbatim from Julius Clarus: "Know then that there are five degrees of torture: First, the threat of the rack; second, being taken into the torture chamber; third, being undressed and bound; fourth, being laid upon the rack; fifth, turning the rack."[2] The *territio realis* was therefore by no means the first degree of torture; the first was the threat of torture, still outside the torture chamber in the ordinary court, called *territio verbalis*,[3] which proceeding we find in the examination of Galileo on 21st June. The expression "*examen rigorosum*" in the sentence, appears therefore, taking it to indicate torture in a general sense, fully justified by historical facts.

It would be more difficult to prove that "*examen rigorosum*" in the sentence meant actual torture, or *territio realis*. According to the rules of the Holy Office, a number of strict regulations were prescribed for the procedure, which began with taking the accused into the torture chamber, and the neglect of any one of them made the whole examination null and void. The most important were as follows: First,

[1] Page 25.

[2] "Gradus torturae olim adhiberi soliti fuerunt quinque, qui certo ordine fuerunt inflicte, quos describit Julius Clarus 'in pract crim.' § Fin. qu. 64, versic. 'Nunc de gradibus,' ubi ita ait, 'Scias igitur, quod quinque sunt gradus torturae; scilicet Primo, minae de torquendo. Secundo: conductio ad locum tormentorum. Tertio, spoliato et ligatura. Quarto elevatio in eculeo. Quinto, squassatio." (Philippi a Limborch S.S. Theologiae inter Remonstrantes Professoris, Historia Inquisitionis. Amstelodami apud Henricum, Westenium, 1692, p. 322.)

[3] Prof. P. Grisar also remarks in his critique of Wohlwill's last work *Zeitschrift für Kath. Theol.* ii. Jahrgang, p. 188), that in the language of the old writers on criminal law, the *territio verbalis* was often included in the expression torture, and appeals to Julius Clarus, Sentent. crimin. lib. 5, § Fin. qu. 84, nr 31; Francof. 1706, p. 318; Sigism. Scaccia, de judiciis, lib. 2. c 8. nr 276; Francof. 1669, p. 269.

a short final examination had to take place outside the torture chamber, at which the accused was told that he had better confess, or recourse will be had to torture. (This took place precisely according to the rules of the Holy Office at Galileo's trial at the examination on 21st June.) If the accused persisted, and if in a special Congregation for this case the necessity of recourse to torture had previously been agreed upon[1] (this must have taken place in the Congregation of 16th June), the judge had to order the removal of the accused to the torture chamber by a special formal decree, as follows:—"Tunc D.D. sedentes . . . visa pertinacia et obstinatione ipsius constitati, visoque et mature considerato toto tenore processus . . . decreverunt, ipsum constituum esse torquendum tormento funis pro veritate habendo . . . Et ideo mandaverunt ipsum constitutum duci ad locum tormentorum."[2]

Second, a notary of the Inquisition had to be present in the torture chamber, and the judges had to see "that he noted down not only all the answers of the accused, but all his expressions and movements, every word that he uttered on the rack, even every sigh, cry, and groan.[3]

Third, within twenty-four hours after his release from the torture chamber, the accused had to ratify all his utterances under the torments of the rack, or under threat of them, in the usual court. Otherwise the whole proceeding was null and void.[4]

Of all these documents, which must have existed if actual torture had been employed, or even if Galileo had been taken into the torture chamber, there is not a trace in the Acts of the trial in the Vatican. Dr. Wohlwill[5] and Dr. Scar-

[1] "Sacro Arsenale," p. 155.

[2] Ibid. pp. 157, 161, 165.

[3] Ibid. p. 157; Salleles, "De materiis tribunalium S. Inquisitionis," reg. 361, nos. 110, 117.

[4] Ibid. p. 410; Limborch, p. 325.

[5] In his brochure, "Ist Galilei gefoltert worden."

tazzini [1] assert, with more boldness than evidence, that most of these documents did exist, but that afterwards, and in the present century, as the whole of the documents have been tampered with for a special purpose, these compromising papers have been withdrawn! The Vatican MS. contains one document which, one would think, is indisputable evidence that only the *terrítio verbalis* was employed against Galileo. We allude to the Protocol of the last examination of 21st June. Up to the final answer of the accused the questions of the Inquisitor agree *verbatim* with the formula of examination which the "Sacro Arsenale" gives for questioning as to the Intention;[2] but when, if it was intended to proceed to torture or even to take Galileo into the torture chamber, the decree about it should follow, we find instead the concluding sentence: "*Et cum nihil aliud posset haberi in executionem decreti habitâ eius subscriptione remissus fuit ad locum suum.*" This is, up to the words "*in executionem decreti*," the usual concluding sentence of the last examination when it ended without torture.[3] These exceptional words refer to the decree of 16th June, 1633, which minutely described the judicial proceedings to be taken against Galileo, and by which certainly the *threat* of torture, but by no means actual recourse to it, was ordained by the Pope and the Sacred Congregation.[4]

[1] "Il Processo di Galileo Galilei e la Moderna Critica Tedesca," III. *Revista Europea*, vol. v., fasc. ii., 1878.

[2] Page 214.

[3] "Sacro Arsenale," pp. 62, 64.

[4] The passage in the decree is: "S^{mus} decrevit ipsum (Galileo) inter rogandum esse super intentione, etiam comminata ei tortura et si sustenuerit, previa abiuratione de vehementi in plena Congregatione S.O. condemnandum ad carcerem," etc. (Vat. MS. Fol. 451 vo.) Wohlwill says that the first part of this decree has had about as many interpretations as authors who have quoted it. This may in no small degree be due to the fact that it was not known whether the original reading was *et* or *ac* sustinuerit. As it is now decided in favour of *et*, perhaps an agreement may be come to, and the more so as several students of Galileo's trial have adopted a translation which agrees as to the meaning, to which

The concluding sentence of the last examination of Galileo being on the one hand in exact agreement with the decree of 16th June, and on the other being a precise and definite statement, is a strong proof of the correctness of the opinion long defended by calm and impartial historians, like Albèri, Reumont, Biot, Cantor, Bouix, Troussart, Reusch, and even the passionate opponent of Rome, Prof. Chasles, that Galileo's feeble frame was never subjected to the horrors of torture. Wohlwill also acknowledges the force of this concluding sentence—if it be genuine. He thinks these words are a falsification in the present century, while originally Galileo's last answer was followed by the necessary decree for proceeding to torture, and then by the protocol about the proceedings in the torture chamber. Dr. Scartazzini goes even further than Wohlwill, and maintains that not only the concluding sentence, but the whole protocol of the examination of 21st June, as now found in the Vatican MS., is a later falsified insertion. We shall see why he thinks so by and by.

We may remark in passing, from our own experience, that it is always venturesome to affirm that there are falsifications in a MS. without even having seen it, to say nothing of having examined it. Thus, for instance, a glance at the original shows on material grounds that there can be no suspicion of falsification or later insertion in the protocol of 21st June. Both pages on which it is written, fols. 452, 453, are second pages to fols. 413 and 414, on which the protocol of Galileo's trial of 12th April begins. A later

we ourselves, now that the *et* is unquestionable, adhere. H. Martin, Pro. Reusch, Dr. Scartazzini, Pro. P. Grisar, Epinois in his latest work, and the present writer, translate: "His Holiness ordained that he (Galileo) was to be examined as to his intention, to be threatened with torture, and if he kept firm (to his previous depositions) after *abjuration de vehementi*, he was to be sentenced to imprisonment by the whole Congregation of the Holy Office," etc. Whatever may be thought of the translation, one thing is certain, that by this decree the threat of torture was ordained, but assuredly not its execution.

insertion is therefore an impossibility. Besides, the protocol of 21st June ends in the middle of fol. 435 ro, and, after a space of scarcely two fingers' breadth follows an annotation of 30th June, 1633, in exactly the same handwriting as the annotations of 16th June, 1633, 23rd September, 9th and 30th December, 1632. This really seems to render the bold conjecture of falsification wholly untenable.

The unquestioned genuineness of Galileo's signature, which concludes this as well as all the other protocols, is also a guarantee of its authenticity. Dr. Scartazzini has taken advantage of our information that this signature, unlike all Galileo's others, is in a very trembling hand, to assert that it is not genuine. We are of opinion that a forger would have taken every pains to make the signature as much like the others as possible, and certainly would not have written in remarkably trembling characters. No; this signature, which is unmistakably like the rest, reflects his fearful agitation, and is by no means a forgery of the nineteenth century.

Let us see now why Dr. Scartazzini insists that not only the concluding sentence, but the whole protocol of 21st June, is a falsification. The reason is not far to seek. As we have seen, according to the rules of the Inquisition, if Galileo had really suffered torture, or if they had only proceeded to *territio realis* against him, within twenty-four hours of leaving the torture chamber he would have had to confirm the depositions made there, in the ordinary court. But the passing of the sentence and the recantation took place on the 22nd, on the day therefore on which the tortured Galileo would have had to ratify these depositions, and not till after this could the sentence be legally drawn up. Dr. Scartazzini sees plainly enough that Galileo's ratification, the drawing up and passing of the sentence, and the recantation, could not possibly all have taken place in one morning. But he finds his way out of this *cul-de-sac* in a remarkably simple manner; he boldly asserts that the date is false, that the

last examination was not on 21st June, but earlier, perhaps on the 17th! The whole protocol, therefore, must be false. Of course Dr. Scartazzini has not a shadow of evidence to give for his assertion. He contents himself with the singular reason that the papal decree of 16th June did not admit of a delay of five or six days, but would be at once carried out.[1] This arbitrary assertion is contradicted by the official report of Niccolini to Cioli of 26th June, 1633, in which he says that Galileo was summoned on Monday evening to the Holy Office, and went on Tuesday morning to learn what was wanted of him; he was detained there, and taken on Wednesday to the Minerva.[2] The dates given by Niccolini agree precisely with those of the protocol of Galileo's last hearing, which is assumed to be false! In face of this evidence, so conclusive for any serious historian, Dr. Scartazzini remarks: "the Tuscan ambassador's memory must have failed him, whether involuntarily or voluntarily."[3] We leave all comment on this kind of historical evidence to the reader.

But we must raise a decided protest, in the name of impartial history, against the way in which Dr. Scartazzini, in order to lend some probability to the above remark, afterwards tries to make out that Niccolini had repeatedly sent romances to Florence, in order to represent to the Grand Duke, who was so anxious about Galileo, how much he (Niccolini) had exerted himself for him, and had actually achieved. Thus Dr. Scartazzini comes to the conclusion, which must excite the ire of every right-minded person, that "the Tuscan ambassador, Niccolini, is a liar."[4] Niccolini then, Galileo's noblest, most devoted, and inde-

[1] "Il Processo di Gal. Gal.," etc.: *Revista Europea*, vol. v., fasc. ii. p. 232, 1878.

[2] Op. ix. pp. 444, 445.

[3] "Il Processo di Gal. Gal.," etc.: *Revista Europea*, vol. v., fasc. ii., 16th January, 1878, p. 233.

[4] Ibid. p. 247.

fatigable friend, who was at his side in every difficulty, and certainly did more for him at Rome than was ordered at Florence, and perhaps even more than was approved,—this historical figure, worthy of our utmost reverence,—was a liar! Happily it is with Dr. Scartazzini alone that the odium of the accusation rests; in the annals of *history*, the name of Niccolini stands untarnished, and every Italian, every educated man, will think with gratitude of the man who nobly and disinterestedly stood by the side of Galileo Galilei at the time of his greatest peril. Honour be for ever to his memory!

We give, in conclusion, one more instance of a curious kind of evidence that Galileo really was subjected to torture. Professor Eckert thinks he knows with "almost geometrical certainty that Galileo suffered torture during the twenty-four hours which he spent before the Inquisition." In proof of this assertion the author says: "In conclusion, the two hernias which the unfortunate old man had after his return is a proof that he must have endured that kind of torture called *il tormento della corda*."[1] This shrewd conclusion falls to the ground in face of the medical certificate of 17th December, 1632, wherein among the rest we find: "We have also observed a serious hernia, with rupture of the peritoneum."[2] And further, this certificate affords indisputable evidence that both his age[3] and his state of health, in consequence of the rupture, were sufficient to protect him against torture according to the rules of the Holy Office.[4] Galileo would have had to be professionally examined by a physician and surgeon, and, according to their written report, he would either have been subjected to torture, or a dispensation would have been granted against it, and all this would have been minutely

[1] "Galileo Galilei; dessen Leben," etc., Basle, 1858, p. 16.
[2] Vat. MS. fol. 407.
[3] "Farinacci, de indiciis et tortura," a. 41.
[4] Th. del Bene, "De officio S. Inquisitionis," vol. i. p. 574.

recorded in the Acts of the trial.[1] It is needless to say that among these papers there is not a trace either of any protest of Galileo's, nor of the certificates of the physicians of the Holy Office; and that according to the protocol of the hearing of 21st June, it never went so far, and the Pope himself, as the decree of 16th June undoubtedly proves, never intended that it should.

No, Galileo never suffered bodily torture, nor was he even terrified by being taken into the torture chamber and shown the instruments; he was only mentally stretched upon the rack, by the verbal threat of it in the ordinary judgment hall, while the whole painful procedure, and finally the humiliating public recantation, was but a prolonged torture for the old man in his deep distress. Libri, Brewster, and other rhetorical authors have desired to stamp Galileo as a "martyr of science" in the full sense of the words. But this will not do for two reasons, as Henri Martin[2] justly points out. In the first place, Galileo did not suffer torture; and in the second, a true martyr, that is, a witness unto blood, never under any circumstances, not even on burning coals, abjures his opinions, or he does not deserve the name.

For the sake of Galileo's moral greatness, his submission may be regretted, but at all events greater benefit has accrued from it to science, than if, in consequence of a noble steadfastness which we should have greeted with enthusiasm, he had perished prematurely at the stake or had languished in the dungeons of the Inquisition. It was after the famous trial that he presented the world with his immortal "Dialoghi delle Nuove Scienze."

[1] "Sacro Arsenale," pp. 171, 172.

[2] Page 197.

PART III.

GALILEO'S LAST YEARS.

CHAPTER I.

GALILEO AT SIENA AND ARCETRI.

Arrival at Siena.—Request to the Grand Duke of Tuscany to ask for his release.—Postponed on the advice of Niccolini.—Endeavours at Rome to stifle the Copernican System.—Sentence and Recantation sent to all the Inquisitors of Italy.—Letter to the Inquisitor of Venice.—Mandate against the Publication of any New Work of Galileo's or New Edition. —Curious Arguments in favour of the Old System.—Niccolini asks for Galileo's release.—Refusal, but permission given to go to Arcetri.—Anonymous accusations.—Death of his Daughter.—Request for permission to go to Florence.—Harsh refusal and threat.—Letter to Diodati.—Again at work.—Intervention of the Count de Noailles on his behalf.—Prediction that he will be compared to Socrates.—Letter to Peiresc.—Publication of Galileo's Works in Holland.—Continued efforts of Noailles.—Urban's fair speeches.

GALILEO arrived safely at Siena on 9th July, and was most heartily welcomed by Ascanio Piccolomini.[1] But neither his devoted kindness, nor stimulating converse with his friend, who was well versed in science, and the learned Alessandro Marsili, who lived at Siena, could make him forget that he was still a prisoner of the Inquisition, and that his residence there was compulsory. He longed for liberty, the highest earthly good, and next to this for Florence, which had become a second home to him. In order to attain this fervent desire, on 23rd July he addressed a letter to Cioli,[2] with an urgent request that his Highness the Grand Duke, to please whom Urban VIII. had done so much, would be graciously pleased to ask the Pope, on whose will alone it depended, for his release. Only five days afterwards, Galileo received tidings from Cioli that Ferdinand II. had in the

[1] Op. ix. p. 372.

[2] Op. vii. pp. 31, 32.

kindest manner consented to make the attempt, and that Niccolini was already commissioned to petition at the Vatican, in the name of the Grand Duke, for a full pardon for his chief philosopher.[1] But the ambassador had good reasons for thinking that it was too soon, and that it would certainly be in vain to ask for Galileo's entire release, and replied to this effect to Cioli, adding the advice not to do anything in it till autumn.[2] It was therefore decided at Florence, in consideration of Niccolini's doubts and his intimate knowledge of affairs at Rome, not to intervene with the Pope in favour of Galileo for two months, which decision was communicated by Bocchineri to the prisoner at Siena in a letter of 13th August.[3]

While Galileo was bearing his banishment in Siena, which Ascanio Piccolomini did all in his power to ameliorate, with resignation, and was even diligently at work on his "Dialoghi delle Nuove Scienze," war was being waged with great vigour against the Copernican doctrine at Rome, and the utmost efforts were being made to stifle it in Catholic countries in general, and in Italy in particular. Urban VIII. first visited with severe punishment all those dignitaries of the Church who, in virtue of their official position, had conduced to the publication of the "Dialogues." Father Riccardi was deprived of his office, and the Inquisitor at Florence was reprimanded for having given permission to print the work.[4] In accordance with a decree passed in the sitting of the Congregation of 16th June, 1633, the sentence on, and recantation of, Galileo were sent to all the nunciatures of Europe, as well as to all archbishops, bishops, and inquisitors of Italy. The form in which this commission was issued

[1] Comp. the letters of Cioli and Geri Bocchineri to Galileo of 28th July. (Op. ix. pp. 278, 279.)

[2] Niccolini's despatch to Cioli of 7th August. (Op. ix. p. 447.)

[3] Op. ix. pp. 383, 384.

[4] Vat. MS. fol. 476 vo. and 493 ro.; also Gherardi's Documents, Doc. xviii.

to the ecclesiastical dignitaries is of great historical interest. One of the letters which accompanied the decree and ordered its publication has been preserved to us by Father Polacco in his "Anti-Copernicus Catholicus," published at Venice in 1644.[1] It was addressed to the Inquisitor at Venice, and was as follows; the rest were probably similar:—

Most Reverend Father,—

Although the treatise of Nicholas Copernicus, 'De Revolutionibus Orbium Celestium," had been suspended by the Congregation of the Index, because it was therein maintained that the earth moves, but not the sun, but that it stands still in the centre of the world (which opinion is contrary to Holy Scripture); and although many years ago, Galileo Galilei, Florentine, was forbidden by the Congregation of this Holy Office to hold, defend, or teach the said opinion in any way whatsoever, either verbally or in writing; the said Galileo ventured nevertheless to write a book signed Galileo Galilei Linceus; and as he did not mention the said prohibition, he extorted licence to print, and did then actually have it printed. He stated, in the beginning, middle, and end of it, that he intended to treat the said opinion of Copernicus hypothetically, but he did it in such a manner (though he ought not to have discussed it in any way) as to render himself very suspicious of adhering to this opinion. Being tried on this account, and in accordance with the sentence of their Eminences, my Lords, confined in the prison of the Holy Office, he was condemned to renounce this opinion, to remain in prison during their Eminences' pleasure, and to perform other salutary penances; as your Reverences will see by the subjoined copy of the sentence and abjuration, which is sent to you that you may make it known to your vicars, and that you and all professors of philosophy and mathematics may have knowledge of it; that they may know why they proceeded against the said Galileo, and recognise the gravity of his error in order that they may avoid it, and thus not incur the penalties which they would have to suffer in case they fell into the same.

Your Reverences, as brother,
Cardinal of St. Onufrius.

Rome, 2nd July, 1633.

Again it is worthy of note, that even in this letter it was deemed necessary to lay special stress on the circumstance that Galileo had acted contrary to a special prohibition issued several years before. But then, to be sure, this formed the only *legal* ground for the proceedings against him.

[1] Page 68.

From a letter from Guiducci to Galileo from Florence of 27th August,[1] we learn the manner in which the publication had taken place there, on the 12th. Both the documents were read aloud in a large assembly of counsellors of the Holy Office, canons and other priests, professors of mathematics and friends of Galileo, such as Pandolfini, Aggiunti, Rinuccini, Peri, and others, who had been invited to the ceremony. This proceeding was followed in all the more important cities of Italy, as well as in the larger ones of Catholic Europe. It is characteristic of the great split which existed in the scientific world about the Copernican system, that Professor Kellison, Rector of the University of Douai, wrote in reply to a letter of the Nuncio at Brussels, who had sent the sentence and recantation of Galileo to that academy: "The professors of our university are so opposed to that fanatical opinion (*phanaticæ opinioni*), that they have always held that it must be banished from the schools. . . . In our English college at Douai this paradox has never been approved, and never will be."[2]

The Roman curia, however, did not confine itself to trying to frighten all good Catholics from accepting the Copernican doctrine by as wide a circulation as possible of the sentence against Galileo; but in order to suppress it altogether as far as might be, especially in Italy, all the Italian Inquisitors received orders neither to permit the publication of a new edition of any of Galileo's works, nor of any new work.[3] On the other hand, the Aristotelians, who had been very active since the trial, were encouraged to confute the illustrious dead, Copernicus and Kepler, and the now silenced Galileo, with tongue and pen. Thus in the succeeding decades the book market was flooded with refutations of the Copernican system.[4]

[1] Op. ix. pp. 390–392.

[2] Vat. MS. fol. 544.

[3] Op. x. pp. 75–77, 81; Suppl. pp. 362, 363.

[4] Henri Martin (pp. 386–388) gives an interesting list of works published against the Copernican system between 1631 and 1638, up therefore to the time of Newton.

In fighting truth with falsehood very curious demonstrations were sure now and then to come to light on the part of the adherents of the wisdom of the ancients. We will here only mention a book dedicated to Cardinal Barberini, which appeared in 1633: "Difesa di Scipione Chiaramonti da Cesena al suo Antiticonè, e libro delle tre nuove stelle, dall' opposizioni dell' Autore de' due massimi sistemi Tolemaico e Copernicano," in which such sagacious arguments as the following are adduced against the doctrine of the double motion of the earth:—

"Animals, which move, have limbs and muscles; the earth has no limbs or muscles, therefore it does not move.

"It is angels who make Saturn, Jupiter, the Sun, etc., turn round. If the earth revolves, it must also have an angel in the centre to set it in motion; but only devils live there, it would therefore be a devil who would impart motion to the earth.

"The planets, the sun, the fixed stars, all belong to one species; namely, that of stars—they therefore all move or all stand still.

"It seems, therefore, to be a grievous wrong to place the earth, which is a sink of impurity, among the heavenly bodies, which are pure and divine things."[1]

But although Galileo was condemned to silence, there were courageous and enlightened men who, in spite of the famous sentence of the Inquisition, not only rejected such absurdities but made energetic advance along the new paths. At the Vatican, however, they seemed disposed, as we shall soon see, to make Galileo answerable for the defence of the Copernican system in Italy. For instance, at the beginning of November the Tuscan ambassador thought the time was come to take steps for obtaining pardon for Galileo with some prospect of success; and at an audience of the Pope on 12th November he asked, on behalf of the Grand Duke, for the prisoner's release. Urban replied somewhat ungraciously, that he would see what could be done, and would consult with the Congregation of the Holy Office; but he remarked that it had

[1] Venturi, vol ii. p. 127.

come to his ears that some people were writing in defence of the Copernican system. Niccolini hastened to assure him that Galileo was not in the least implicated in it, and that it was done entirely without his knowledge. Urban answered drily, that he had not been exactly informed that Galileo had anything to do with it, but he had better beware of the Holy Office. In spite of reiterated urgent entreaty, Niccolini could get nothing more definite about Galileo's release than the above evasive promise, and he communicated the doubtful success of his mission to Cioli in a despatch of 13th November,[1] in rather a depressed state of mind.

Urban was not disposed to grant a full pardon to Galileo, and therefore made a pretext of the Congregation to the ambassador, as if the decision depended upon it, whereas it rested entirely with himself. Niccolini, however, still persisted in his efforts. He went to Cardinal Barberini and other members of the Holy Office, warmly recommending him to their protection.[2] Meanwhile an indisposition of the Pope, which lasted fourteen days, delayed the decision, as the Congregation did not venture to come to any without his concurrence. At length he made his appearance in the sitting of the Congregation of 1st December, and through the mediation of Cardinal Barberini, the petition for Galileo's release was at once laid before him.[3] It was refused; but he was to be permitted to retire to a villa at Arcetri, a *miglio* from Florence, where he was to remain until he heard further; he was not to receive any visits, but to live in the greatest retirement.[4] Niccolini informed him of this amelioration of his circumstances in a letter of 3rd December,[5] with the expression of great regret that he could not at present obtain his entire liberation. He added that the Pope had

[1] Op. ix. pp. 447, 448.

[2] Comp. Niccolini's despatch to Cioli, 3rd Dec. (Op. ix. p. 448.)

[3] Vat. MS. fol. 534 ro.

[4] Vat. MS., fol. without paging after 534; also Gherardi's Documents, Doc. xx.

[5] Op. ix. pp. 407, 408.

charged him to say that Galileo might go to Arcetri at once, that he might receive his friends and relations there, but not in large numbers at one time, as this might give rise to the idea that he was giving scientific lectures. A few days after the receipt of this letter Galileo set out for Arcetri.[1]

No sooner had he reached his villa, called "il Giojello," which was pleasantly situated, than he made it his first care to thank Cardinal Barberini warmly for his urgent intercession, which had, however, only effected this fresh alleviation of his sad fate.[2] Some rhetorical historians make Galileo's two daughters leave the Convent of St. Matteo, which was certainly within gunshot of "Giojello," in order to tend their old and suffering father with childlike and tender care; a touching picture, but without any historical foundation. On the contrary, it was really one of Galileo's greatest consolations to pay frequent visits to his daughters, to whom he was tenderly attached, at St. Matteo, when permitted to do so by the Holy Office. It was also a great satisfaction to him that on a very early day after his arrival at Arcetri the Grand Duke came from Florence, and paid the convict of the Inquisition a long visit.[3]

But while Galileo was once more partaking of some pleasures, the implacable malice of his enemies never slumbered.

[1] At the close of this year two documents were published which have often been used as historical sources for the story of Galileo's trial; namely; (1) a narration by Francesco Buonamici of the famous trial; and (2) an assumed letter of Galileo's to his friend and correspondent, Father Vincenzo Renieri, intended to give a concise history of the trial. The first has been pronounced by historical research to be quite worthless, even if not, as H. Martin (p. 185) thinks, a forgery; the second as decidedly apocryphal, so that neither are mentioned here. (Comp. Op. ix. pp. 449–452; vii. pp. 40–43; and the valuable treatise by G. Guasti: "Le relazioni di Galileo con alcuni Pratesi a proposito del Falso Buonamici scopalto del Signor H. Martin." Archivo Storico Italiano. Firenze, 1873, vol. xvii.)

[2] See Galileo's letter to Barberini, 17th December, 1633. (Vat. MS. fol. 541 ro.)

[3] Op. x. pp. 2 and 11.

There were even some who would have been glad to know that he was for ever safe in the dungeons of the Inquisition. As, however, he gave them no pretext on which they could, with any shadow of justice, have seized him, they had recourse to the most disgraceful means—to lying, anonymous denunciation, in which his enlightened and therefore disliked friend, the Archbishop Ascanio Piccolomini, was ingeniously involved. On 1st February, 1634, the following communication, without signature, was received at the Holy Office at Rome from Siena:—

Most Reverend Sirs,—

Galileo has diffused in this city opinions not very Catholic, urged on by this Archbishop, his host, who has suggested to many persons that Galileo had been unjustly treated with so much severity by the Holy Office, and that he neither could nor would give up his philosophical opinions which he had defended with irrefragable and true mathematical arguments; also that he is the first man in the world, and will live for ever in his works, to which, although prohibited, all modern distinguished men give in their adherence. Now since seeds like these, sown by a prelate of the Church, might bring forth evil fruit, a report is made of them.[1]

Although this cowardly denunciation did not bear any immediate consequences either to Piccolomini or Galileo, events which took place soon after show most clearly the unfavourable impression it produced at the Vatican. Galileo, who was very unwell, asked permission of the Pope, through the mediation of his faithful friend Niccolini, to move into Florence for the sake of the regular medical treatment which he required, and which he could not well have at the villa outside the city.[2] As if to dye his tragic fate still darker, just while he was awaiting the result of Niccolini's efforts, his favourite daughter Polissena, or by her conventual name Marie Celeste, was taken so ill that her life was soon despaired of.

It was on one of the last days of March that Galileo was returning to his villa with a physician from a visit to his

[1] Vat. MS. fol. 547.

[2] Vat. MS. fol. 549.

dying daughter at the Convent of St. Matteo, in deep depression of spirits. On the way the physician had prepared him for the worst by telling him that the patient would scarcely survive till the morning, which proved to be the case. On entering his house in anguish of soul, he found the messenger of the Inquisition there, who in the name of the Holy Office gave him a strict injunction to abstain from all such petitions in future, unless he desired to compel the Inquisition to imprison him again. This unmerciful proceeding had been ordered by a papal mandate of 23rd March.[1] The Inquisitor at Florence reported on it on 1st April to Cardinal Barberini, as follows :—

"I have communicated to Galileo what was commanded by your Eminence. He adduced as an excuse that he had only done it on account of a frightful rupture. But the villa he lives in is so near the city that he can easily have the physicians and surgeons there, as well as the medicines he requires."[2]

A passage in a letter from Galileo to Geri Bocchineri at Florence, of 27th April, shows that the excuse was no empty pretext, and that he urgently needed to have medical aid always at hand. He says :—

"I am going to write to you about my health, which is very bad. I suffer much more from the rupture than has been the case before ; my pulse intermits, and I have often violent palpitation of the heart ; then the most profound melancholy has come over me. I have no appetite, and loathe myself ; in short, I feel myself perpetually called by my beloved daughter. Under these circumstances I do not think it advisable that Vincenzo should set out on a journey now, as events might occur at any time which might make his presence desirable, for besides what I have mentioned, continued sleeplessness alarms me not a little."[3]

A letter to Diodati at Paris, from Galileo, of 25th July, is also of great interest ; an insight may be gained from it, not only into his melancholy state of mind, but it also contains some remarkable indications of the motives for the

[1] Vat. MS. fol. 550 vo. ; and Gherardi's Documents, Doc. xxii.
[2] Vat. MS. fol. 551 ro.
[3] Op. vii. p. 44.

fierce persecution on the part of Rome. We give the portions of the letter which are important for our subject:—

"I hope that when you hear of my past and present misfortunes, and my anxiety about those perhaps still to come, it will serve as an excuse to you and my other friends and patrons there (at Paris), for my long delay in answering your letter, and to them for my entire silence, as they can learn from you the unhappy turn which my affairs have taken. According to the sentence pronounced on me by the Holy Office, I was condemned to imprisonment during the pleasure of his Holiness, who was pleased, however, to assign the palace and gardens of the Grand Duke near the Trinità dei Monti, as my place of imprisonment. As this was in June of last year, and I had been given to understand that if I asked for a full pardon after the lapse of that and the following month, I should receive it, I asked meanwhile, to avoid having to spend the whole summer and perhaps part of the autumn there, to be allowed, on account of the season, to go to Siena, where the Archbishop's house was assigned to me as a residence. I staid there five months, when this durance was exchanged for banishment to this little villa, a *miglio* from Florence, with a strict injunction not to go to the city, and neither to receive the visits of many friends at once, nor to invite any. Here, then, I was living, keeping perfectly quiet, and paying frequent visits to a neighbouring convent, where two daughters of mine were living as nuns; I was very fond of them, especially of the eldest, who possessed high mental gifts, combined with rare goodness of heart, and she was very much attached to me. During my absence, which she considered very perilous for me, she fell into a profound melancholy, which undermined her health, and she was at last attacked by a violent dysentery, of which she died after six days' illness, just thirty-three years of age, leaving me in the deepest grief, which was increased by another calamity. On returning home from the convent, in company with the doctor who visited my sick daughter shortly before her death, and who had just told me that her situation was desperate, and that she would scarcely survive till the next day, as indeed it proved, I found the Inquisitor's Vicar here, who informed me of a mandate from the Holy Office at Rome, which had just been communicated to the Inquisitor in a letter from Cardinal Barberini, that I must in future abstain from asking permission to return to Florence, *or they would take me back there (to Rome), and put me in the actual prison of the Holy Office.* This was the answer to the petition, which the Tuscan ambassador had presented to that tribunal after I had been nine months in exile! From this answer it seems to me that, in all probability, my present prison will only be exchanged for that narrow and long-enduring one which awaits us all.

From this and other circumstances, which it would take too long to repeat here, it will be seen that the fury of my powerful persecutors continually increases. They have at length chosen to reveal themselves to

me; for about two months ago, when a dear friend of mine at Rome was speaking of my affairs to Father Christopher Griemberger, mathematician at the college there, this Jesuit uttered the following precise words:—'*If Galileo had only known how to retain the favour of the fathers of this college, he would have stood in renown before the world, he would have been spared all his misfortunes, and could have written what he pleased about everything, even about the motion of the earth.*' From this you will see, honoured Sir, that it is not this opinion or that which has brought, and still brings about my calamities, *but my being in disgrace with the Jesuits.*

I have also other proofs of the watchfulness of my persecutors. One is that a letter from some foreigner, I do not know from whom, addressed to me at Rome, where he supposed me still to be, was intercepted, and delivered to Cardinal Barberini. It was fortunate for me, as was afterwards written to me from Rome, that it did not purport to be an answer to one from me, but a communication containing the warmest praises of my "Dialogues." It was seen by many persons, and, as I hear, copies of it were circulated at Rome. I have also been told that I might see it. To add to all this, there are other mental disquietudes and many bodily sufferings oppressing me at the age of over seventy years, so that the least exertion is a torment and a burden to me. In consideration of all this, my friends must be indulgent to me for omissions which look like neglect, but really arise from inability."[1]

This deep dejection, however, could not last long with a man of so active a mind as Galileo. The impulse which had been implanted in him to investigate the problems of nature was too strong to be repressed by either mental or bodily sufferings. So far from it, it was this which, ever re-asserting itself with its normal energy, helped him to bear them with resignation, and he often forgot his painful situation in his scientific speculations. Thus, but a few months after his daughter's death, we find him rousing himself and eagerly at work again on his masterpiece, the "Dialoghi delle Nuove Scienze."[2] He also resumed his extensive scientific correspondence, of which unfortunately, and especially of the following year, 1635, the letters of his correspondents only have mostly come down to us.[3]

[1] Op. vii. pp. 46–51.
[2] Op. x. pp. 66–69; 71–74; vii. pp. 56, 57.
[3] Op. vii. pp. 52–58; x. 41–134; Suppl. pp. 271–278.

While the prisoner of Arcetri was thus eagerly fulfilling his great mission to his age, his friends were exerting themselves in vain to obtain at least an extension of his liberty. The Count de Noailles, French ambassador at Rome, had once attended Galileo's lectures at Padua, and had become so enthusiastic an adherent, that he afterwards told Castelli that he must see Galileo once more before leaving Italy, even if he walked fifty miles on purpose.[1] He therefore united his efforts with Niccolini's to obtain some amelioration for Galileo. But in vain. At an audience which Niccolini had on 8th December, 1634, Urban said indeed that he esteemed Galileo very highly, and was well disposed towards him; but all remained as before.[2]

In the year 1634 the band of dauntless men, who again and again ventured to attempt to obtain Galileo's liberty from the papal chair, was increased by the celebrated officer of state and man of learning, Fabri von Peiresc. Like Noailles, he had attended Galileo's lectures at Padua,[3] had since been one of his most ardent admirers, and had long maintained friendly intercourse with Cardinal Francesco Barberini. Peiresc now interceded eagerly with this prelate for Galileo, and even ventured openly to say, in a long and pressing letter of 5th December, 1634, to Barberini.:—[4] . . "Really such proceedings will be considered very harsh, and far more so by posterity than at present, when no one, as it appears, cares for anything but his own interests. Indeed, it will be a blot upon the brilliance and renown of the pontificate of Urban VIII., unless your Eminence resolves to devote your special attention to this affair. . . ." On

[1] Castelli's letter to Galileo, 2nd Dec., 1634. (Op. x. p. 64.)

[2] Castelli's letter to Galileo, 9th Dec., 1634. (Op. x. p. 65.)

[3] Comp. Peiresc's letters to Galileo, 26th Jan., 1634 (Op. x. pp. 8–11), and to Card. Barberini, 5th Dec., 1635 (Op. x. p. 94).

[4] Op. x. pp. 94–96. In Albèri the date of this letter is wrongly given as 1635; Pieralisi has found the original of it in the Barberiana, with date 5th Dec., 1634. (Pieralisi, pp. 304–310.)

2nd January, 1635, Barberini wrote a long letter in reply,[1] in which he was prolix enough on many subjects, but about Galileo he only made the dry remark, towards the end of the letter, that he would not fail to speak to his Holiness about it, but Peiresc must excuse him if, as a member of the Holy Office, he did not go into the subject more particularly. In spite of this, however, only four weeks later, Peiresc again urged Barberini, in a letter of 31st January,[2] to exert his powerful influence on behalf of Galileo. Peiresc justified his zeal by saying, "that it arose as much from regard for the honour and good name of the present pontificate, as from affection for the venerable and famous old man, Galileo; for it might well happen, by a continuance of the harsh proceedings against him, that some day posterity would compare them with the persecutions to which Socrates was subjected."[3]

Galileo, who had received copies of these letters, thanked Peiresc most warmly in a letter of 21st February, 1635, for his noble though fruitless efforts, and added the following remarkable words:—

"As I have said, I do not hope for any amelioration, and this because I have not committed any crime. I might expect pardon and favour if I had done wrong, for wrong-doing affords rulers occasion for the exercise of clemency and pardon, while towards an innocent man under condemnation, it behoves them to maintain the utmost severity, in order to show that they have proceeded according to law. But believe me, revered sir, and it will console you to know it, this troubles me less than would be supposed, for two grounds of consolation continually come to my aid: one of these is, that in looking all through my works, no one can find the least shadow of anything which deviates from love and veneration for the Holy Church; the other is my own conscience, which can only be fully known to myself on earth and to God in heaven. He

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[1] Op. x. pp. 96–98. In Albèri this letter is dated 1636 instead of 1635.

[2] Op. x. pp. 98, 99. Date wrongly given in Albèri as 13th instead of 31st Jan. See Pieralisi, pp. 313–317.

[3] These words were written in a truly prophetic spirit; for such a parallel was actually drawn by Voltaire in (vol. iv. p. 145) his "Essai sur les mœurs et l'esprit des nations, et sur les principaux faits de l'histoire, depuis Charlemagne jusquà Louis XIII."

knows that in the cause for which I suffer, many might have acted and spoken with far more learning and knowledge, but no one, not even among the holy fathers, with more piety and greater zeal for the Holy Church, nor altogether with purer intentions. My sincerely religious, pious spirit would only be the more apparent if the calumnies, intrigues, stratagems, and deceptions, which were resorted to eighteen years ago to deceive and blind the authorities, were brought to the light of day." [1]

If the issue of the assumed stringent prohibition of 1616 were admitted, this letter would be a piece of hypocrisy as glaring as it was purposeless; for in that case Galileo would not have been an innocent man under condemnation, who had committed no crime, and his conscience could not have consoled him in his painful situation. What he wrote to Peiresc about his religious spirit was also quite true. Galileo really was a truly religious man; his own revolutionary discoveries had not for a moment given rise to any doubts in his mind of supernatural mysteries as taught by the Roman Catholic Church. All his letters, even to his most intimate friends, proclaim it indisputably. He also perfectly well knew how to make his researches and their results agree with the dogmas of his religion, as is clear from his explanations to Castelli, Mgr. Dini, and the Grand Duchess Christine. The strangest contradictions were continually arising from this blending of a learned man striving to search out the truths of nature, and a member of the only true Church bound in the fetters of illusive credulity. Thus, at the end of 1633, he did not hesitate to act in opposition to his solemn oath, literally construed, by secretly sending a copy of his condemned and prohibited "Dialogues" to Diodati, at Paris, that they might be translated into Latin, and thus be more widely circulated. In 1635 the work really appeared in a Latin translation, from the press of the Elzevirs, in Holland, edited by a Strasburg professor, Mathias Bernegger, in order that no suspicion might rest upon Galileo of having had anything to do with

[1] Op. Suppl. pp. 361–363.

it.[1] Such an act was very improper for a pious Catholic, and Galileo really was one. In the following year, however, he told his old friend, Fra Fulgenzio Micanzio, at Venice, with great delight, that Bernegger had brought out by the same publishers the Apology to the Grand Duchess Christine of 1615, in Italian with a Latin translation. The secret translator, concealed under the pseudonym of Ruberto Robertini Borasso, was also Diodati.[2] In a letter to Micanzio, as well as in another of 12th July, Galileo expressed an ardent wish that a large number of copies of it might be introduced into Italy, "to shame his enemies and calumniators.[3] As we know, this letter to the Grand Duchess contained nothing but a theological apology for the Copernican system, so that what gratified Galileo so much in its publication, was that the world would now learn that he, who had been denounced as a heretic, had always been an orthodox Christian, into whose head it had never entered, as his enemies gave out, to attack the holy faith. Martin is quite justified in saying that "the reputation of a good Christian and true Catholic was as dear to Galileo as that of a good astronomer."[4]

While Galileo was enjoying the twofold satisfaction of seeing his "Dialogues" attain a wider circulation (they had meanwhile been translated into English),[5] and yet of being acknowledged as a pious subject of the Roman Catholic Church, the Count de Noailles continued his efforts at Rome, before his approaching departure from Italy, to obtain pardon for Galileo. Castelli, who, in consequence of his too great devotion to Galileo and his system, had been banished for three years from Urban's presence, had

[1] Op. x. pp. 25–33; vii. pp. 52, 53, and 128.

[2] Op. x. pp. 29–33; vii. p. 140.

[3] Op. vii. pp. 65, 66, and 67, 68; also Galileo's letter to Bernegger, 15th July, 1636. (Op. vii. pp. 69, 70.)

[4] Page 222.

[5] Comp. Galileo's letter to Giovanni Buonamici, 16th August, 1636. (Op. vii. pp. 139, 140.)

at length, by the end of 1635, been taken into favour again,[1] and reported faithfully to Galileo all the steps taken to procure his liberty. The utmost caution had been exercised in order to attain this end.[2] Count Noailles and Castelli had persuaded Cardinal Antonio Barberini, in repeated interviews, that nothing had been further from Galileo's intention than to offend or make game of Urban VIII., upon which the cardinal, at the request of the French ambassador, promised to intercede with his papal brother for Galileo. On 11th July Noailles made the same assurances to the Pope at an audience, whereupon he exclaimed: "Lo crediamo, lo crediamo!" (We believe it), and again said that he was personally very well disposed to Galileo, and had always liked him; but when Noailles began to speak of his liberation, he said evasively that *this affair was of the greatest moment to all Christendom.* The French diplomatist, who knew Urban's irritable temper, did not think it advisable to press him further, and consoled himself for the time, even after this cool reply, with the thought that the brother cardinal had promised to use his good offices for Galileo.

Castelli informed Galileo in a letter of 12th July[3] of all this, and advised him to write a letter of thanks to Cardinal Antonio for his kind intercession, which he at once did.[4] Noailles placed all his hopes on a farewell audience with the Pope, in which he meant to ask for Galileo's pardon. On 8th August he drove for the last time to the Vatican. Urban was very gracious, and when Galileo's affairs were introduced he even promised at last to bring the subject

[1] See Castelli's letter to Galileo of 2nd June, 1635, in which he says that "he had at last been again permitted to kiss his Holiness's toe." (Op. x. pp. 99, 100.)

[2] Comp. the letters of Castelli and the Count de Noailles to Galileo of 19th April and 6th May, 1636. (Op. x. pp. 149, 150, and 153.)

[3] Op. x. pp. 159, 160.

[4] Op. x. pp. 161 and 163.

before the Holy Congregation.[1] Noailles told Cardinal Antonio of this most favourable result with joyful emotion, who said at once: "Good! good! and I will speak to all the cardinals of the Holy Congregation."[2] They were apparently justified in entertaining the most sanguine hopes, but the future taught them that all this was nothing but fair speeches with which Urban had taken leave of the French ambassador. For there can be no doubt that if the Pope, with his absolute power, had been in earnest about Galileo's liberation, the Congregation would not have been slow to comply with his wishes. Galileo, however, remained as before, a prisoner in his villa at Arcetri, which he had meanwhile bought, and the papal favour, of which a promise had been held out, was limited to allowing him, at the end of September, to accept an invitation from the Grand Duke to visit him at his Villa Mezzomonte, three miles from Florence,[3] and on 16th October to leave his place of exile for one day to greet the Count de Noailles, at Poggibonsi, in passing through it on his way to France.[4] This was the extent of the papal clemency for the present, and it was not till the old man was quite blind and hopelessly ill, with one foot in the grave, that any humane feeling was awakened for him at the Vatican.

[1] See Castelli's letter to Galileo, 9th August. (Op. x. pp. 163, 164.)
[2] Ibid.
[3] Op. Suppl. p. 280.
[4] Op. x. p. 172.

CHAPTER II.

FAILING HEALTH AND LOSS OF SIGHT.

Galileo's Labours at Arcetri.—Completion of the "Dialoghi delle Nuove Scienze."—Sends it to the Elzevirs at Leyden.—Method of taking Longitudes at Sea.—Declined by Spain and offered to Holland.—Discovery of the Libration and Titubation of the Moon.—Visit from Milton.—Becomes Blind.—Letter to Diodati.—On a hint from Castelli petitions for his Liberty.—The Inquisitor to visit him and report to Rome.—Permitted to live at Florence under Restrictions.—The States-General appoint a Delegate to see him on the Longitude Question.—The Inquisitor sends word of it to Rome.—Galileo not to receive a Heretic.—Presents from the States-General refused from fear of Rome.—Letter to Diodati.—Galileo supposed to be near his End.—Request that Castelli might come to him.—Permitted under Restrictions.—The new "Dialoghi" appear at Leyden, 1638.—They founded Mechanical Physics.—Attract much Notice.—Improvement of Health.—In 1639 goes to Arcetri again, probably not voluntarily.

GALILEO was unceasingly active in his seclusion at Arcetri. In the year 1636 he completed his famous "Dialoghi delle Nuove Scienze."[1] He also exerted himself, like a loving father who wishes to see his children provided for before he dies, about the preservation and republication of his works which were quite out of print. But all these efforts were frustrated by envy, ecclesiastical intolerance, and the unfavourable times. His cherished scheme of bringing out an edition of his collected works could neither be carried out by the French mathematician, Carcavy, who had warmly taken up the subject,[2] nor by the Elzevirs through the mediation of Micanzio.[3] He had also to give up his pro-

[1] Comp. Galileo's letters to Micanzio at Venice of 21st and 28th June 1636. (Op. vii. pp. 63–66.)

[2] Op. x. pp. 88, 89, 104, 105, 116–118, 191, 192; vii. pp. 132, 154, 155.

[3] Op. x. pp. 157, 158, 165, 170, 171, 213; vii. 63, 64, 67, 68, 71, 138, 253.

ject of dedicating his "Dialoghi delle Nuove Scienze" to the German Emperor, Ferdinand II., and of publishing them at Vienna, as he learnt from his friend and former pupil there, Giovanni Pieroni, that his implacable foes, the Jesuits, were all-powerful; that Ferdinand himself was entirely under their influence; and moreover that his bitterest foe, Father Scheiner, was just then at Vienna.[1] In the following year, however (1637), Pieroni succeeded by his prudent and untiring efforts, during the temporary absence of Scheiner, in obtaining a licence for Galileo's latest work,[2] and afterwards one at Olmütz also; but meanwhile he had sent the MS. by Micanzio[3] to be printed by the Elzevirs at Leyden, and, under the circumstances described by Pieroni, he did not prefer to bring out his book at a place where his bitterest enemies were in power.

He was at this time also deeply interested in a subject which originated as far back as 1610. It had occurred to him soon after the discovery of Jupiter's moons, by a series of observations of them, to make astronomical calculations and tables which would enable him to predict every year their configurations, their relative positions and occasional eclipses with the utmost precision; this would furnish the means of ascertaining the longitude of the point of observation at any hour of the night, which appeared to be of special importance to navigation. For hitherto the eclipses of the sun and moon had had to be employed for the purpose, which, however, on account of their rarity and the want of precise calculation, were neither entirely to be relied on nor sufficient. Galileo had offered his discovery, —the practical value of which he overrated,—in 1612, to the Spanish Government, and in 1616 tedious negotiations were carried on about it, which however led to no result,

[1] Op. x. pp. 66–69, 108–111, 127–130.
[2] Pieroni to Galileo, 9th July, 1637. (Op. x. pp. 222–226.)
[3] Comp. Op. vii. pp. 138, 139, 152, 153; x. pp. 167 and 184.

were then postponed till 1620, and in 1630 entirely given up.[1] Now (August, 1636,) as he heard that the Dutch merchants had even offered a premium of thirty thousand scudi to any one who should invent a sure method of taking longitudes at sea, he ventured, without the knowledge of the Inquisition, to offer his invention to the Protestant States-General. Diodati at Paris was the mediator in these secret and ceremonious negotiations. On 11th November, Galileo's offer was entertained in the most flattering manner in the Assembly of the States-General, and a commission was appointed, consisting of the four *savans*, Realius, Hortensius, Blavius, and Golius, to examine into the subject and report upon it.[2]

While Galileo was impatiently waiting for the decision that was never come to, he made his last great telescopic discovery, although suffering much in his eyes, that of the libration and titubation of the moon, about which he wrote his remarkable letter to Alfonso Antonini, bearing the signal date: "Della mia carcere di Arcetri li 10 febbrajo 1637."[3]

The complaint in Galileo's eyes grew rapidly worse. By the end of June the sight of the right eye was gone, and that of the other diminished with frightful rapidity from a constant discharge.[4] But in spite of this heavy calamity, combined with his other sufferings, his interest in science did not diminish for a moment. Even at this sad time we find him carrying on a brisk correspondence with the learned men of Germany, Holland, France, and Italy, continuing his negotiations with the States-General with great zest,[5] as well as occupying himself perpetually with astro-

[1] Comp. Op. vi. pp. 238–276, 338–346.
[2] Op. vii. pp. 73–93, and 136, 137.
[3] Op. iii. pp. 176–183.
[4] Comp. Galileo's letter to Diodati of 4th July, 1637. (Op. vii. p. 180.)
[5] Comp. Op. vii. pp. 163–174, 190–204; x. pp. 215–218, 228–248; Suppl. pp. 282–284.

nomy and physics. He was indeed often obliged to employ the hand of another;[1] but his mind worked on with undiminished vigour, even though he was no longer able to commit to paper himself the ideas that continually occupied him.

On 2nd September he received a visit from his sovereign, who came to console and encourage him in his pitiable situation.[2] A few months later an unknown young man, of striking appearance from his handsome face and the unmistakable evidences which genius always exhibits, knocked at the door of the solitary villa at Arcetri: it was Milton, then twenty-nine years of age, who, travelling in Italy, sought out the old man of world-wide fame to testify his veneration.[3]

In December of the same year Galileo became permanently quite blind, and informed Diodati of his calamity on 2nd January, 1638, in the following words:—

"In reply to your very acceptable letter of 20th November, I inform you, in reference to your inquiries about my health, that I am somewhat stronger than I have been of late, but alas! revered sir, Galileo, your devoted friend and servant, has been for a month totally and incurably blind; so that this heaven, this earth, this universe, which by my remarkable observations and clear demonstrations I have enlarged a hundred, nay, a thousand fold beyond the limits universally accepted by the learned men of all previous ages, are now shrivelled up for me into such narrow compass that it only extends to the space occupied by my person."[4]

Up to the time when Galileo entirely lost his sight, ab-

[1] Op. vii. p. 193.

[2] Op. x. pp. 231, 232.

[3] . . . "Here I found and called upon the celebrated Galileo, now become old and a prisoner of the Inquisition," says Milton. Unfortunately we know nothing more of this interesting meeting. (Comp. Reumont, p. 405.)

[4] Op. vii. p. 207. See on Galileo's total blindness, "Sull' epoca vera e la durata della cecità del Galileo," Nota del Angelo Secchi: (Estratta dal Giornale Arcadico, Tomo liv nuova serie); and "Sull' nella epoca della completa cecità del Galileo," Risposta di Paolo Volpicelli al chiaris e R. P. A. Secchi, Roma, 1868.

solutely nothing had been able to be done for his liberation at Rome. Even the faithful Castelli wrote on 12th September, to Galileo's son Vincenzo, that he had not been able to do anything whatever for his father; but he piously adds, "I do not fail every morning at holy mass to pray the Divine Majesty to comfort him, to help him, and to grant him His Divine grace."[1] This precisely indicates the hopeless state of Galileo's affairs. Just then, during the first few days of December of the same year, darkness closed round him for ever; and not long afterwards, 12th December, Castelli suddenly wrote to him, that he had been given to understand that Galileo had not been forbidden in 1634 to send petitions *direct* to the Holy Office, but only through other persons.[2] When the decided papal rescript of 23rd March, 1634,[3] is compared with this curious interpretation of it, there can be no doubt that it was intended to enable the curia to take a more lenient view without direct collision with a former mandate. Galileo at once sent Castelli's letter to the Tuscan Court, with a request for instructions, as he did not wish to do anything without the concurrence of his sovereign.[4] He was informed that he had better draw up a petition to the Holy Office, and get it handed in at Rome through Castelli.[5] The latter had meanwhile informed himself under what formalities Galileo should make his request, and sent him on 19th January, 1638,[6] a draught of the petition, with the remark that it must be sent, together with a medical certificate, direct to the assessor of the Congregation of the Holy Office; this Galileo immediately did. The petition was as follows:—

[1] Op. x. p. 232.

Op. x. pp. 248, 249.

[3] Comp. p. 275, note 1.

[4] Galileo's letter to Guerrini, an official at the Tuscan Court, 19th December. (Op. vii. pp. 204, 205.)

[5] Guerrini to Galileo, 20th December. (Op. x. pp. 249, 250.)

[6] Op. x. pp. 254, 255.

"Galileo Galilei, most humble servant of your most worthy Eminence, most respectfully showeth that whereas, by command of the Holy Congregation, he was imprisoned outside Florence four years ago, and after long and dangerous illness, as the enclosed medical certificate testifies, has entirely lost his eyesight, and therefore stands in urgent need of medical care: he appeals to the mercy of your most worthy Eminences, urgently intreating them in this most miserable condition and at his advanced age to grant him the blessing of his liberty."

The utmost caution was exercised at Rome before granting this petition. No confidence was placed in the medical certificate; but the Inquisitor-General of Florence, Father Fanano, was instructed to visit Galileo and to make an exact report of his health, and whether it was to be feared, if he lived at Florence, that he would promote the propagation of his errors.[1] Fanano at once conscientiously executed his commission, and on 13th February, 1638, sent the following report to Cardinal Francesco Barberini :—

"In order the better to execute his Holiness's commission, I went myself, accompanied by a strange physician, an intimate friend of mine, to see Galileo, quite unexpectedly, at his villa at Arcetri, to find out the state he was in. My idea was not so much by this mode of proceeding to put myself in a position to report on the nature of his ailments, as to gain an insight into the studies and occupations he is carrying on, that I might be able to judge whether he was in a condition, if he returned to Florence, to propagate the condemned doctrine of the double motion of the earth by speeches at meetings. I found him deprived of his eyesight, entirely blind; he hopes for a cure, as the cataract only formed six months ago, but at his age of seventy the physician considers it incurable. He has besides a severe rupture, and suffers from continual weariness of life and sleeplessness, which as he asserts, and it is confirmed by the inmates of his house, does not permit him one hour's sound sleep in the twenty-four. He is besides so reduced that he looks more like a corpse than a living man. The villa is a long way from the city, and the access is inconvenient, so that Galileo can but seldom, and with much inconvenience and expense, have medical aid.[2] His studies are interrupted by his

[1] Gherardi's Documents, Doc. xxiii.

[2] This passage directly contradicts the remark on this subject in the report of Fra Clemente, the Inquisitor, of 1st April, 1634; his successor, Fra Fanano, seems to have been more favourable to Galileo.

blindness, though he is read to sometimes; intercourse with him is not much sought after, as in his poor state of health he can generally only complain of his sufferings and talk of his ailments to occasional visitors. I think, therefore, in consideration of this, if his Holiness, in his boundless mercy, should think him worthy, and would allow him to live in Florence, he would have no opportunity of holding meetings, and if he had, he is so prostrated that I think it would suffice, in order to make quite sure, to keep him in check by an emphatic warning. This is what I have to report to your Eminence." [1]

This report at last opened the eyes of Urban VIII. as to Galileo's real condition. The cry of distress from the blind old man, approaching dissolution, was too well justified to be wholly ignored, and a partial hearing was given to it at all events, at a sitting of the Congregation held on 25th February, under the presidency of the Pope.[2] But a full release, in spite of the information that Galileo was more like a corpse than a living man, still appeared too dangerous to be ventured on. On 9th March Galileo received from the Inquisitor-General, Father Fanano, the following communication:—

"His Holiness is willing to allow you to remove from your villa to the house which you own in Florence, in order that you may be cured of your illness here. But on your arrival in the city you must immediately repair, or be taken, to the buildings of the Holy Office, that you may learn from me what I must do and prescribe for your advantage." [3]

Galileo availed himself of the permission to return to his little house, Via della Costa, at Florence, on the very next day. Here the Inquisitor-General, as charged by the Holy Office, informed him, "for his advantage," of the order, *not to go out in the city under pain of actual imprisonment for life and excommunication, and not to speak with any one whomsoever of the condemned opinion of the double motion of*

[1] Op. x. pp. 280, 281.
[2] Gherardi's Documents, Doc. xxiv.
[3] Op. x. p. 286.

the earth.[1] It was also enjoined upon him not to receive any suspicious visitors.

It is characteristic of the mode of proceeding of the Inquisition, that Fanano set Galileo's own son, who was nursing him with the tenderest affection, to watch over him. The Inquisitor enjoined upon Vincenzo to see that the above orders were strictly obeyed, and especially to take care that his father's visitors never stayed long. He remarks, in a report to Francesco Barberini of 10th March, that Vincenzo could be trusted, "for he is very much obliged for the favour granted to his father to be medically treated at Florence, and fears that the least offence might entail the loss of it; but it is very much to his own interest that his father should behave properly and keep up as long as possible, for with his death a thousand scudi will go, which the Grand Duke allows him annually." In the opinion of the worthy Father Fanano, then, the son must be anxious for his father's life for the sake of the thousand scudi! In the same letter the Inquisitor assured Barberini that he would himself keep a sharp look out that his Holiness's orders were strictly obeyed, which, as we shall soon see, he did not fail to do.

Galileo's confinement in Florence was so rigorous that at Easter a special permission from the Inquisition was required to allow him to go to the little Church of San Georgio, very near his house, to confess, to communicate, and to perform his Easter devotions,[2] and even this permission only extended expressly to the Thursday, Good Friday, Saturday, and Easter Sunday.[3] On the other hand, as appears from the dates of his letters,[4] he was allowed,

[1] Fanano's letter to Cardinal F. Barberini of 10th March, 1638. (Op. x. p. 287.)

[2] Gherardi's Documents, Doc. xxv.

[3] Letter of the Vicar of the Holy Office at Florence to Galileo, of 28th March, 1638. (Op. x. p. 292.)

[4] Op. vii. pp. 211–216.

during June, July, and August, to go several times to and fro between his villa at Arcetri and Florence.

Galileo was now once more to discover how rigidly he was watched by the Inquisition. His negotiations with the States-General, in spite of the urgent intercession of such men as Diodati, Hortensius, Hugo Grotius, Realius, Constantine Huyghens (Secretary of the Prince of Orange, and father of the celebrated Christian Huyghens), and others, had not led to any result. His proposed method of taking longitudes at sea, well worked out as it was theoretically, presented many difficulties in practical application. His methods of precisely determining the smallest portions of time, and of overcoming the obstacles occasioned by the motion of the vessel, did not prove to be adequate.[1] He had endeavoured, in a long letter to Realius of 6th June, 1637,[2] to dismiss or refute all the objections that had been made; but this did not suffice, and although the States-General acknowledged his proposal in the main in the most handsome terms, even accepted it, and offered him a special distinction (of which presently), it appeared necessary to have some personal consultation on the subject with the inventor. For this purpose, Hortensius, who had also a great desire to make Galileo's acquaintance, was to go to Florence.[3] The Inquisitor-General heard that a delegate was coming from Germany to confer with Galileo on the subject. He at once reported this on 26th June to Rome,[4] whence he received instructions under date of 13th July from the Congregation of the Holy Office, that Galileo *must not receive the delegate if he were of a heretical religion, or from a heretical country*, and the Inquisitor will please communicate this to Galileo; on the other hand, there was nothing to prevent the interview *if the*

[1] See letters from Hortensius and Realius to Galileo of 26th Jan. and 3rd Mar. 1637 (Op. vii. pp. 95–99, 100–102); letter from Const. Huyghens to Diodati, 13th April, 1637 (Op. vii. pp. 111–113).

[2] Op. vii. pp. 163–174. [3] Op. vii. pp. 181–189.

[4] Vat. MS. fol. 554 ro.

person came from a Catholic country, and himself belonged to the Catholic religion; only, in accordance with the previous regulations, the doctrine of the double motion of the earth must not be spoken of.[1]

A few days after the Inquisitor had delivered his instructions to Galileo, the German merchants of the name of Ebers residing in Florence, presented him in the name of the Dutch Government with a very flattering letter, and a heavy gold chain, as a recognition of his proposals and a pledge of the ultimate adjustment of the negotiations. The envoys of the States-General found Galileo very ill in bed, his blinded eyes continually running and very much inflamed. He *felt* the gold chain, which he could not see, and had the letter read to him. He then handed the chain back to the merchants, on the plea that he could not keep it now, as the negotiations had been interrupted by his illness and loss of sight, and he did not at all know whether he should ever be in a position to carry them through.[2] The real motive, however, was nothing but fear of the Inquisition,[3] and as the sequel showed, he was quite right. Fanano sent a report on 25th July of all these circumstances to Cardinal Barberini at Rome. It is so characteristic that we cannot refrain from giving it:—

"The person who was to come to see Galileo has neither appeared in Florence, nor is likely to appear, so far as I am informed; but I have not yet been able to learn whether in consequence of some hindrance on the journey or from some other cause. I know, however, that presents for Galileo and a letter to him have come to some merchants here. A highly estimable person, who is in my confidence, and has spoken with the person who has the presents and letter in charge, told me that both bear the seal of the Dutch Government; the presents are in a case, and may be gold or silver work. Galileo has steadily refused to accept either the letter or the presents, whether from fear of incurring some danger, on account of the warning I gave him on the first news of the

[1] Vat. MS. fol. 555 vo.; and Gherardi's Documents, Doc. xxvi.

[2] On all this see Galileo's letter to Diodati of 7th Aug., 1638. (Op. vii pp. 214–216.)

[3] Comp. Nelli, vol. ii. pp. 678, 679, and Venturi, vol. ii. p. 285.

expected arrival of an envoy, or whether because he really could not perfect his method of taking longitudes at sea, and is not in a state to do it; for he is now quite blind, and his head is more in the grave than fit for mathematical studies. Insurmountable difficulties had also occurred in the use of the instruments indicated by him. Besides, it is said here, that if he had fully brought his plan to perfection, his Highness (Ferdinand II. of Tuscany) would never have permitted it to pass into the hands of renegades, heretics, or enemies of the allies of his house. This is what I have to report to your Eminence."[1]

The news that Galileo had not accepted the distinction offered him by the Dutch Government gave great satisfaction at Rome; and Urban VIII. even charged the Inquisitor at Florence, by a mandate of 5th August, to express to Galileo the gratification of the Holy Congregation at his conduct in this affair.[2]

About this time he was sunk so low, physically as well as mentally, that he and every one thought his dissolution was at hand. In a letter to Diodati of 7th August, in which he told him of his interview with the German merchants at Florence, he expressed the fear that "if his sufferings increased as they had done during the last three or four days, he would not even be able to dictate letters."[3] He added, perhaps in reference to the Inquisitor's intimation of 13th July: "It would be a fruitless undertaking if Signor Hortensius were to take the trouble to come and see me, for if he found me living (which I do not believe), I should be quite unable to give him the least satisfaction."

His profound vexation about the regulations imposed upon him in this matter by the Roman curia is very evident in a letter to Diodati of 14th August. He writes:—

"As ill luck would have it, the Holy Office came to know of the negotiations I was carrying on about the geographical longitude with the

[1] Vat. MS. fol. 553 ro.; and Op. x. 304, 305, where it is dated 23rd nstead of 25th July.

[2] Vat. MS. fol. 556 vo.; and Gherardi's Documents, Doc. xxvii.

[3] Op. vii. p. 215.

States-General, which may do me the greatest injury. I am extremely obliged to you for having induced Signor Hortensius to give up his intended journey, and thereby averted some calamity from me which would probably have been in store for me if he had come. It is indeed true that these negotiations ought not to do me any harm, for the just and obvious reasons that you mention, but rather to bring me fame and honour, if my circumstances were but like those of other men, that is, if I were not pursued by misfortune more than others. But having been often and often convinced by experience of the tricks fate plays me, I can but expect from its obstinate perfidy, that what would be an advantage to any one else will never bring anything but harm to me. But even in this bitter adversity I do not lose my peace of mind, for it would be but idle audacity to oppose inexorable destiny."[1]

Galileo, who thought his hours were numbered, dictated his will on 21st August, in the presence of a notary and witnesses, and directed that he should be buried in the family vault of the Galilei in the Church of Santa Croce at Florence.[2] On 8th September the Grand Duke paid the dying astronomer, as was supposed, a visit of two hours, and himself handed him his medicine.[3]

It had been for a long time a cherished wish of Galileo's to have with him during the evening of his days his most devoted and favourite disciple, Father Castelli.[4] But the professorship which he held at Rome made the attainment of this wish difficult. As it was now supposed that a speedy death would deprive the world of the great philosopher, the Grand Duke requested through Niccolini at Rome that Castelli might come to Florence, for a few months at least, that he might yet receive from the lips of his dying master many ideas of importance for science, which he might not perhaps confide to any but his trusted friend.[5] After some difficulties were surmounted, he actually received the papal

[1] Op. vii. pp. 216–218.

[2] Op. xv. p. 401; Nelli, vol. ii. p. 838.

[3] Op. xv. (Viviani), p. 371.

[4] Comp. Castelli's letters to Galileo of 29th May and 30 July, 1638. (Op. x. pp. 300, 310–313.)

[5] Cioli's despatch to Niccolini of 9th Sept., 1638. (Op. x. pp. 313, 314.)

consent, but only on condition that a third person should always be present during the conversations with Galileo.[1] Early in October Castelli arrived in Florence, where the Inquisitor-General, as charged by the Holy Office, gave him permission to visit Galileo, with the express prohibition, *under pain of excommunication, to converse with him on the condemned doctrine of the earth's double motion.*[2] The permission, however, to visit Galileo seems to have been very limited, for Castelli repeatedly wrote to Cardinal Francesco Barberini, with the most urgent entreaties to obtain an extension of it for him from the Pope. Castelli protests in this letter that he would rather lose his life than converse with Galileo on subjects forbidden by the Church. He gives as a reason for the need of more frequent interviews that he had received from the Grand Duke the twofold charge to minister to Galileo in spiritual matters, and to inform himself fully about the tables and ephemerides of the Medicean stars, because the Prince Giovanni Carlo, Lord High Admiral, was to take this discovery to Spain.[3] The cardinal replied that in consideration of these circumstances, Urban VIII. granted permission for more frequent visits to Galileo, under the known conditions;[4] but the official permission, was not issued until about November.[5] Nothing is known in history, however, of the Lord High Admiral's having ever taken Galileo's method of taking longitudes to the Peninsula.

During the same year (1638), the Elzevirs at Leyden issued Galileo's famous work: "Discourses on and Demon-

[1] Niccolini's despatches to Cioli of 15th and 25th Sept. (Wolynski, "La Diplomazia Toscana," etc., pp. 68, 69.)

[2] Fanano's letter to Card. Barberini of 4th Oct. (Op. x. p. 314.)

[3] See Castelli's letters to Card. F. Barberini of 2nd, 9th, and 16th Oct., in Pieralisi, pp. 291–296; and another of 23rd Oct., 1638, on an unnumbered page between fols. 552 and 553 of the Vat. MS. p. 175.

[4] See Card. Barberini's letters to Castelli of 16th and 30th Oct. (Pieralisi, pp. 294, 295, and 298.)

[5] Vat. MS. fol. 557 vo.

strations of Two New Sciences appertaining to Mechanics and Motion."[1] This work, known under the abridged title, "Dialoghi delle Nuove Scienze," was dedicated to the Count de Noailles, in grateful remembrance of the warm interest which he had always shown in the author.[2] It is the most copious and best of all Galileo's writings, and he himself valued it more highly than any of the others.[3] In it he created the new sciences of the doctrine of cohesion in stationary bodies, and their resistance when torn asunder; also that of phoronomics, and thereby opened up new paths in a field of science that had been lying fallow. He must, indeed, be regarded as the real founder of mechanical physics. It is not our province to enter farther into the contents of this work, or its importance for science. It has, however, some significance in our historical review of Galileo's relations with the curia, for it excited immense attention in all learned circles, and increasingly attracted the notice of the scientific world to the prisoner of the Inquisition. This was by no means agreeable to the Romanists, who would have been glad to see him sink into oblivion. Galileo now again received communications from all countries, some of them expressing the highest admiration of his new work, and others asking more information on many of the theories expounded. And we now behold the shattered old man of seventy-four, only partially recovered from his severe illness, carrying on an extensive correspondence full of the most abstruse problems in physics and mathematics.[4]

In January, 1639, as his health had so far improved as to allow the hope to be indulged that he might be spared some

[1] "Discorsi e Dimostrazione Matematiche intorno a due Scienze attenenti alla Meccanica e ai Movimenti Locali. Con una Appendice del Centro di gravita di alcuni Solidi."

[2] See Galileo's letter to the Count de Noailles of 6th March, 1638, and his answer of 20th July. (Op. vii. pp. 209–211, and x. pp. 308–310.)

[3] Comp. Op. vii. pp. 44, 46, 57, 70.

[4] Op. vii. pp. 218–226; x. pp. 316, 317, 320, 321.

time longer, he returned to his villa at Arcetri, not to leave it again alive. Was this move a voluntary one? We have no document which finally settles the question. But we hold ourselves justified in doubting it. Not only because it is difficult to reconcile a voluntary return to Arcetri with his previous efforts to obtain permission to reside in Florence, but there is a later letter from him bearing the expressive date: "From the Villa Arcetri, my perpetual prison and place of exile from the city."[1] And when the wife of Buonamici, who was distinguished for her mental powers, gave him a pressing invitation to Prato, which is only four miles from Florence, he reminds her in his reply of 6th April, 1641, that "he was still a prisoner here for reasons which her husband was well aware of"; he then presses her to visit him at Arcetri, adding: "Do not make any excuses, nor fear that any unpleasantness may accrue to me from it, for I do not trouble myself much how this interview may be judged by certain persons, as I am accustomed to bearing many heavy burdens as if they were quite light."[2] From such utterances it is clear that Galileo had little pleasure in residing at Arcetri, and that therefore his second banishment from Florence was not voluntary, but was the result of a papal order.[3]

[1] "Dalla Villa Arcètri, mio continuato carcere ed esilio dalla città." (Letter from Galileo to Cassiano dal Pozzo in Rome, of 20th Jan., 1641, Op. vii. p. 351.)

[2] Op. vii. pp. 364, 365.

[3] Pieralisi thinks ("Urbano VIII. and Galileo Galilei," p. 264) that it was left to Galileo's option during the last few years to reside either at Arcetri or Florence, and that his preference for his villa led him to choose the former; a statement for which Pieralisi has no proof to offer, and which is strongly opposed to what we have mentioned above.

CHAPTER III.

LAST YEARS AND DEATH.

Refusal of some Favour asked by Galileo.—His pious Resignation.—Continues his scientific Researches.—His pupil Viviani.—Failure of attempt to renew Negotiations about Longitudes.—Reply to Liceti and Correspondence with him.—Last Discussion of the Copernican System in reply to Rinuccini.—Sketch of its Contents.—Pendulum Clocks.—Priority of the discovery belongs to Galileo.—Visit from Castelli.—Torricelli joins Viviani.—Scientific discourse on his Deathbed.—Death, 8th Jan., 1642.—Proposal to deny him Christian Burial.—Monument objected to by Urban VIII.—Ferdinand II. fears to offend him.—Buried quietly.—No Inscription till thirty-two years later.—First Public Monument erected by Viviani in 1693.—Viviani directs his Heirs to erect one in Santa Croce.—Erected in 1738.—Rome unable to put down Copernican System.—In 1757 Benedict XIV. permits the Clause in Decree forbidding Books which teach the new System to be expunged.—In 1820 permission given to treat of it as true.—Galileo's Work and others not expunged from the Index till 1835.

WE now come to the last three years of Galileo's life.

From two documents published by Professor Gherardi,[1] we learn that in 1639 Galileo once more asked at Rome for some favours not specified, but that they were absolutely refused by the Pope. From this time Galileo came no further into direct contact with the Roman curia. He had been compelled to give up all hope of any amelioration of his lot from the implacable Urban VIII. So he ended his days quietly and resigned, as the prisoner of the Inquisition, in his villa at Arcetri. Castelli also, who (as his letters to Galileo of 1639 bear witness)[2] had warmly exerted himself on his behalf with Cardinal Barberini and other influential persons, had prob-

[1] Gherardi's Documents, Docs. xxviii. and xxix.

[2] Castelli's letters to Galileo of 29th Jan., 12th Feb., 1639. (Op. x. pp. 325, 326, and 328, 329.)

ably come to the conclusion that nothing more could be done for his unfortunate friend, for from this time we find nothing in his letters to Galileo but scientific disquisitions and spiritual consolations.[1]

This indicates the two interests which occupied the latest period of Galileo's life—deep piety and scientific meditations. His utter hopelessness and pious resignation are very clearly expressed in the brief sentence he used often to write to Castelli: "Piace cosi a Dio, dere piacere cosi ancora a Noi."[2] (If it please God, it ought also to please us.) He never omitted in any letter to his old friend and pupil to commend himself in conclusion to his prayers,[3] and in his letter of 3rd December, 1639, he added: "I remind you to persevere in your prayers to the all-merciful and loving God, that He will cast out the bitter hatred from the hearts of my malicious and unhappy persecutors."

The lofty genius with which nature had endowed Galileo never displayed itself in so striking and surprising a manner as during these last three years. No sooner were his physical sufferings in some measure relieved, than he occupied himself in scientific speculations, the results of which he partly communicated to his great pupil and subsequent biographer, Viviani, by word of mouth, and partly dictated them to some of those about him. The society of young Viviani, then eighteen years of age, who, by permission of the Inquisition, spent the last two years and a half of the old master's life near him,[4] was the greatest comfort to him, and he conceived a fatherly affection for the talented youth. We owe it partly to the assistance and stimulus given by Viviani that the aged Galileo worked on to the end in improving and enlarging his

[1] Op. x. pp. 340–348, 356, 357, 363–365, 367, 368, 385–387, 392–394, 396, 397, 407, 408; Suppl. pp. 287–290.

[2] Op. x. pp. 280 and 308.

[3] Comp. his letters to Castelli of 8th and 19th Aug., 1st and 3rd Sep., 3rd and 18th Dec., 1639. (Op. vii. pp. 232–236, 238, 239, and 242, 243.)

[4] Op. xv. (Viviani), p. 360.

"Dialoghi delle Nuove Scienze," made a number of additions, and added new evidence of great importance to science in two supplementary dialogues.[1]

During this last period of his life also, he again took up the negotiations with the States-General, broken off by his severe illness in 1638. After he became blind he had given up all his writings, calculations, and astronomical tables relating to the Medicean stars, to his old pupil, Father Vincenzo Renieri, in order that he might carry them further; he was well adapted for the task, and executed it with equal skill and zeal.[2] The new ephemerides were just about to be sent to Hortensius, when Diodati informed Galileo of his sudden death in a letter of 28th October, 1639.[3] The three other commissioners charged by the States-General with the investigation of Galileo's proposal having also died one after another, in quick succession, it was difficult to resume the negotiations. The interest of the Netherlanders in Galileo's scheme (perhaps from its acknowledged imperfection) had also evidently cooled, and his proposal to replace the commissioners was not carried out, although he offered to send Renieri to Holland to give all needful explanations by word of mouth. Galileo's death then put an end to these fruitless negotiations.[4]

At the beginning of 1640 Fortunio Liceti, a former pupil of Galileo's, published a book on the phosphorescent Bolognian stone. In the fiftieth chapter of this work he treats of the faint light of the side of the moon not directly illuminated

[1] Op. vii. pp. 238, 239; xiii. pp. 267–332; xv. pp. 358–360.

[2] See his letters to Galileo in 1639 and 1640. (Op. x. pp. 336, 339, 340, 350, 351, 362, 363, 382, 383, 402, 419, 420; also xv. (Viviani), pp. 356, 357.)

[3] Op. vii. pp. 240, 241.

[4] Comp. Op. vii. pp. 243–254. In 1648 Renieri was intending to bring out Galileo's calculations about the satellites of Jupiter, and their application to navigation, which he had completed by long years of labour, when his death occurred after a short illness. The papers were then lost, but were afterwards discovered by Albèri, who arranged them and incorporated them in the "Opere di Galileo Galilei," v.

by the sun, and rejects the view advocated by Galileo in his "Sidereus Nuntius," that it arises from a reflection of the sun's rays striking our earth, which the earth reflects to our satellite, who again reflects them to us. Galileo was undecided whether it were not best to take no notice of Liceti's objections, the scientific value of which he did not estimate very highly, when a letter from Prince Leopold de' Medici, brother of the reigning Grand Duke, relieved him of his doubts.[1] This prince, who has gained a permanent name in the history of science by founding the celebrated "Accadémia del Cimento," invited Galileo to give him his views on Liceti's objections.[2] This challenge sufficed to rouse all the blind old man's dialectic skill, though he was then seventy-six and bowed down by mental and bodily sufferings. He dictated a reply, in the form of a letter to Prince Leopold, which occupies fifty large pages in the extant edition of his "Opere," and in fire, spirit, mastery of language, and crushing argument, it is quite a match for the most famous controversial works of his manhood.[3]

A most interesting direct correspondence then ensued between Galileo and Liceti, which was carried on from June, 1640, to January, 1641, in which not this question only was discussed, but Galileo took occasion to express his opinions, with great spirit and learning, on the modern Peripatetic school and philosophy, on Aristotle himself, and his fanatical followers. These letters of the venerable hero of science are characterised by ostensible politeness pervaded by cutting irony, which makes them instructive and stimulating reading.[4]

[1] Comp. Galileo's letter to Daniele Spinola of 19th Mar., 1640. (Op. vii. pp. 256–258.)

[2] Letter from Prince Leopold de' Medici to Galileo, 11th Mar., 1640. (Op. vii. p. 254.)

[3] Op. vii. pp. 261–310; iii. pp. 190–237.

[4] See this correspondence. (Op. vii. pp. 317–333, 336–350, 352–358.) Liceti published a large book in 1642, in reply to Galileo's letter to Prince Leopold de' Medici. The latter, in which Galileo had made some alterations, was, with his consent, printed with Liceti's reply.

Ten months before his death, thanks to an indiscreet question from one of his former pupils, a last opportunity occurred of speaking of the Copernican system. Francesco Rinuccini, Tuscan resident at Venice, and afterwards Bishop of Pistoja, having apparently forgotten that the master had solemnly abjured that opinion, and had even been compelled to promise to denounce its adherents wherever he met with them to the Inquisition, informed him in a letter of 23rd March, 1641,[1] that the mathematician Pieroni asserted that he had discovered by means of the telescope a small parallax of a few seconds in some of the fixed stars, which would place the correctness of the Copernican system beyond all question. Rinuccini then goes on to say, in the same breath, that he had lately seen the manuscript of a book about to appear, which contained an objection to the new doctrine, and made it appear very doubtful. It was this: because we see exactly one half of the firmament, it follows inevitably that the earth is the centre of the starry heavens. Rinuccini begs Galileo to clear up these doubts for him, and to help him to a more certain opinion.

This was the impulse to Galileo's letter of 29th March, 1641,[2] which, as Alfred Von Reumont truly says,[3] whether jest or mask, had better never have been written. There is no doubt that it must not be taken in its literal sense. Precisely the same tactics are followed as in the letter which accompanied the "Treatise on the Tides," to the Grand Duke of Austria in 1618, and in many passages of the "Dialogues on the Two Systems." Galileo conceals his real opinions behind a thick veil, through which the truth is only penetrable by the initiated. The cautious course he pursued in this perilous answer to Rinuccini is as clever as it is ingenious, and appears appropriate to his circumstances; but it does not produce a pleasant impression,

[1] Op. vii p. 360.

[2] Op. vii. pp. 361–363.

[3] Page 419.

and for the sake of the great man's memory, one would prefer to leave the subject untouched.

We will now examine this interesting letter more closely. When we call to mind the disquisitions on the relation of Scripture to science, which Galileo wrote to Castelli in 1613, and to the Grand Duchess Christine in 1615, the very beginning is a misrepresentation only excusable on the ground of urgent necessity. He says: "The incorrectness of the Copernican system should not in any case be doubted, especially by us Catholics, for the inviolable authority of Holy Scripture is opposed to it, as interpreted by the greatest teachers of theology, whose unanimous declaration makes the stability of the earth in the centre, and the revolution of the sun round it, a certainty. The grounds on which Copernicus and his followers have maintained the contrary fall to pieces before the fundamental argument of the Divine omnipotence. For since this is able to effect by many, aye, endless means, what, so far as we can see, only appears practicable by one method, we must not limit the hand of God and persist obstinately in anything in which we may have been mistaken.[1] And as I hold the Copernican observations and conclusions to be insufficient, those of Ptolemy, Aristotle, and their followers appear to me *far more delusive and mistaken, because their falsity can clearly be proved without going beyond the limits of human knowledge.*"[2]

After this introduction Galileo proceeds to answer Rinuccini's question. He treats that argument against the Copernican system as delusive, and says that it originates in the assumption that the earth stands still in the centre, and by no means from precise astronomical observation. *He*

[1] This is precisely the same argument, only in other words, brought forward by Simplicius at the end of the "Dialogues on the Two Chief Systems." (Comp. p. 160.)

[2] This passage calls the passage in "Il Saggiatore" to mind, where Galileo speaks of Copernicus, Ptolemy, and Tycho.

refutes, therefore, the scientific objection to the new doctrine. Speaking of the assumed discovery of Pieroni, he says, that if it should be confirmed, however small the parallax may be, *human science must draw the conclusion from it that the earth cannot be stationary in the centre.* But in order to weaken this dangerous sentence, he hastens to add, that if Pieroni might be mistaken in thinking that he had discovered such a parallax of a few seconds, those might be still more mistaken who think they can observe that the visible hemisphere never varies, not even one or two seconds; for such an exact and certain observation is utterly impossible, partly from the insufficiency of the astronomical instruments, and partly from the refraction of the rays of light.

As will be seen, Galileo takes great care to show the futility of the new arguments brought into the field against the Copernican system. It therefore seems very strange that some writers, and among them the well-known Italian historian, Cesare Cantu, suppose from this letter that at the close of his life Galileo had really renounced the prohibited doctrine from profound conviction![1] The introduction, and many passages thrown in in this cautious refutation, must, as Albèri and Henri Martin justly observe, be regarded as fiction, the author having the Inquisition in view; it had recently given a striking proof of its watchfulness by forbidding the author of a book called "De Pitagorea animarum transmigratione," to apply the epithet "clarissimus" to Galileo, and it had only with great difficulty been persuaded to permit "notissimus Galileus"![2]

A short time before the close of Galileo's brilliant scientific career, in spite of age, blindness, and sickness, he once more

[1] See "Allgemeine Weltgeschichte," by Cesare Cantu. Freely rendered for Catholic Germany, from the 7th edition, by Dr. J. A. M. Brühl, p. 540.

[2] Comp. Renieri's letter to Galileo of 6th March, 1641. (Op. x. pp. 408, 409.)

gave striking evidence of the genius which could only be quenched by death. It will be remembered that the inadequacy of his proposed chronometer had been the chief obstacle to the acceptance by the States-General of his method of taking longitudes at sea. Now, in the second half of the year 1641, it occurred to him, as is confirmed beyond question by Viviani, who was present,[1] though the idea is generally ascribed to Christian Huyghens, of adding a pendulum to the then very imperfect clocks, as regulator of their motion. As this was sixteen years before Huyghens made known his invention of pendulum clocks, priority indisputably belongs to Galileo. But it was only permitted to the blind master to conceive the great idea—he was not to carry it out. It was his intention to employ the eyes and hands of his son Vincenzo, a very clever mechanician, to put his idea in practice, and he told him of his plan. Vincenzo was to make the necessary drawings according to his father's instructions, and to construct models accordingly. But in the midst of these labours Galileo fell ill, and this time he did not recover.[2] His faithful pupil, Castelli, who probably foresaw the speedy dissolution of the revered old man, came to see him about the end of September, 1641. In October, on the repeated and urgent invitation of Galileo, Torricelli joined Castelli and Viviani, not to leave the Villa Arcetri until they left it with Galileo's coffin. Torricelli was then thirty-three, and the old master had discerned his eminent talents from a treatise on the theory of motion which he had sent him.[3] Castelli was

[1] See his letter of 20th August, 1659, to Prince Leopold de' Medici. (Op. xiv. pp. 339–356.)

[2] Seven years after Galileo's death, Vincenzo was occupied in constructing the first pendulum clock after these drawings and models, when he suddenly fell ill and died. For all this see Albèri's excellent essay: "Dell'orologio a pendolo di Galileo Galilei e di due recenti divinazioni del meccanismo da lui imaginato." (Op. Suppl. pp. 333–358; Nelli, vol. ii. pp. 688–738.)

[3] Comp. Torricelli's letters to Galileo of 15th March, 27th April,

not permitted to stay till the close. At the beginning of November he had to return to Rome, leaving Galileo, Torricelli, and Viviani eagerly occupied with the completion of the "Dialoghi delle Nuove Scienze."

On 5th November Galileo was attacked by an insidious hectic fever, which slowly but surely brought him to the grave.[1] Violent pains in his limbs threw him on a sick bed, from which he did not rise again. In spite of all these sufferings, which were augmented by constant palpitation of the heart and almost entire sleeplessness, his active mind scarcely rested for a moment, and he spent the long hours of perpetual darkness in constant scientific conversation and discussions with Torricelli and Viviani, who noted down the last utterances of the dying man with pious care. As they chiefly related to the "Dialoghi delle Nuove Scienze," they are to be found in the two supplementary Dialogues added to that work.

On 8th January, 1642, the year of Newton's birth, having received the last sacraments and the benediction of Urban VIII., Galileo breathed his last, at the age of nearly seventy-eight years. His son Vincenzo, his daughter-in-law Sestilia Bocchineri, his pupils Torricelli and Viviani, and the parish priest, were around his bed.[2] And when Vincenzo closed his father's sightless eyes for their last long sleep, they gave not a thought at Rome to the severe loss sustained by science by Galileo's death, but only prepared in hot haste to guard the interests of the Church, and as far as it lay in their power, to persecute the Cæsar of science even beyond the grave. The aim was now, as far as possible,

1st and 29th June, 17th August, and 28th September, 1641. (Op. x. pp. 412, 413, 417, 418, 420, 421, 423-426, 432, 433.) Also Galileo's letter to Torricelli of 27th September, 1641. (Op. vii. pp. 365-367.)

[1] See Rinuccini's letter to Prince Leopold de' Medici, 15th November, 1641. (Op. x. pp. 436, 437.)

[2] For this and the preceding, see Op. xv. (Viviani), pp. 360, 361; and Nelli, vol. ii. pp. 839, 840.)

to extinguish his memory, with which so many perils for Rome were bound up.

Even around his bier the struggle began. Some pettifogging theologians went so far as to wish that Christian burial should be denied him, and that his will should be declared null and void, for a man condemned on suspicion of heresy, and who had died as a prisoner of the Inquisition, had no claim to rest in consecrated ground, nor could he possess testamentary rights. A long consultation of the ecclesiastical authorities in Florence, and two circumstantial opinions from them were required to put these fanatics to silence.

Immediately after Galileo's death his numerous pupils and admirers made a collection for a handsome monument to the famous Tuscan. The Inquisitor, Fanano, at once sent word of this to Rome, and received a reply by order of the Pope, dated 23rd January, that he was to bring it in some way to the ears of the Grand Duke that it was not at all suitable to erect a monument to Galileo, who was sentenced to do penance by the tribunal of the Holy Office and had died during that sentence; good Catholics would be scandalised, and the reputation of the Grand Duke for piety might suffer. But if this did not take effect, the Inquisitor must see that there was nothing in the inscription insulting to the reputation of the holy tribunal, and exercise the same care about the funeral sermon.[1]

Besides this, Urban VIII. seized the next opportunity of giving the Tuscan ambassador to understand that "it would be a bad example for the world if his Highness permitted such a thing, since Galileo had been arraigned before the Holy Office for such false and erroneous opinions, had also given much trouble about them at Florence, and had altogether given rise to the greatest scandal throughout Christendom by this condemned doctrine."[2] In the despatch in

[1] Gherardi's Documents, Doc. xxx.

[2] Niccolini's despatch to the Tuscan Secretary of State of 25th January, 1642. (Op. xv. pp. 403, 404.)

which Niccolini reported these remarks of the Pope to his Government, he advised that the matter be postponed, and reminded them that the Pope had had the body of the Duchess Matilda, of Mantua, removed from the Carthusian convent there, and buried at St. Peter's at Rome, without saying a word to the Duke about it beforehand, excusing himself afterwards by saying that all churches were papal property, and therefore all the bodies buried in them belonged to the clergy! If, therefore, they did not wish to incur the danger of perhaps seeing Galileo's bones dragged away from Florence, all idea must be given up for the present of suitably celebrating his memory.

Niccolini received an official reply that there had been a talk of erecting a monument to Galileo, but that his Highness had not come to any decision, and proper regard would certainly be paid to the hints received from the Pope.[1] The weak Ferdinand II. did not venture to act in the least against the heartless Pope's wishes. Even Galileo's desire in his will to be buried in the vault of his ancestors in the Church of Santa Croce, at Florence, was not respected. His mortal remains were placed in a little obscure room, in a side chapel belonging to the Church, called "the Chapel of the Novitiate." He was buried according to the desire of Urban VIII., very quietly, without any pomp. No monument nor inscription marked his resting place; but though Rome did all she could to obliterate the memory of the famous philosopher, she could not effect that the immortal name of Galileo Galilei should be buried in the grave with his lifeless remains.

It was not till thirty-two years later, when Urban VIII. had long been in his grave, and more lenient views were entertained about Galileo at the Vatican, that Fra Gabriel Pierozzi, Rector of the Novices of the Convent of Santa Croce, ventured to adorn Galileo's grave with a long bom-

[1] Despatch of the Tuscan Secretary Condi to Niccolini of 29th January, 1642 (Op. xv. p. 404.)

bastic inscription.[1] In 1693 Viviani, whose greatest pride it was to sign himself "Discépolo ultimo di Galileo," erected the first public monument to his immortal master. The front of his handsome house in the Via San Antonio was made to serve for it, for he placed the bronze bust of Galileo, after the model of the famous sculptor, Giovanni Caccini, over the door. A long eulogy on Galileo was engraved over and on both sides of it.[2]

But Viviani was not content with thus piously honouring the memory of the master; in his last will he enjoined on his heirs to erect a splendid monument to him, which was to cost about 4000 scudi, in the Church of Santa Croce.[3] Decades, however, passed after Viviani's death before his heirs thought of fulfilling his wishes. At length, in 1734, the preliminary steps were taken by an inquiry from the Convent of Santa Croce, whether any decree of the Holy Congregation existed which would forbid the erection of such a monument in the Church? The Inquisitor at Florence immediately inquired of the Holy Office at Rome whether it would be permitted thus to honour a man "who had been condemned for notorious errors."[4] The opinion of the counsellors of the Holy Office was taken. They said that there was nothing to prevent the erection of the monument, provided the intended inscription were submitted to the Holy Congregation, that they might give such orders about it as they thought proper.[5] This opinion was confirmed by the Congregation of the Holy Office on 16th June, 1734.[6] And so the pompous monument to Galileo, which displayed the tastelessness of the age, and was not completed till four years later, could be raised in the Church

[1] Op. xv. p. 405.

[2] See for more on the subject, Nelli, vol. ii. pp. 850–867.

[3] Nelli, vol. ii. pp. 874–876.

[4] Letter of the Inquisitor Fra Paolo Ambr. of 8th June, 1734, to the College of Cardinals at Rome. (See Vat. MS. fol. 558 ro.)

[5] Vat. MS. fol. 561 vo.

[6] Vat. MS. fol. 561 vo., and Gherardi's Documents, Doc. xxxii.

of Santa Croce, this pantheon of the Florentines, where they bury their famous dead, and of which Byron finely sings in "Childe Harold":—

> "In Santa Croce's holy precincts lie
> Ashes which make it holier, dust which is
> Even in itself an immortality,
> Though there were nothing save the past, and this,
> The particle of those sublimities
> Which have relapsed to chaos :—here repose
> Angelo's, Alfieri's bones, and his,
> The starry Galileo, with his woes;
> Here Machiavelli's earth returned to whence it rose."[1]

On 12th March, 1737, Galileo's remains were removed, in presence of all the professors of the University of Florence, and many of the learned men of Italy, with great solemnity and ecclesiastical pomp, from their modest resting-place to the new mausoleum in a more worthy place in the Church of Santa Croce itself, and united with those of his last pupil, Viviani.[2]

It had long been perceived at Rome that, in spite of every effort, it was vain to try to bury the Copernican system with Galileo in the grave. It could no longer greatly concern the Roman curia that Galileo's memory was held in high honour, when the cause for which he suffered had decidedly gained the victory. It was by a singular freak of nature that in the very same year which closed the career of this great observer of her laws, another who was to complete the work begun by Copernicus and carried on by Galileo, entered upon his. He it is, as we all know, who gave to science those eternal forms now recognised as firmly established, and whose genius, by the discovery of the law of gravitation, crowned the edifice of which Copernicus laid the foundations and which Galileo upreared. During the lifetime of the latter, and the period immediately succeeding his death, the truth

[1] Canto iv., stanza liv.

[2] See the document about the exhumation. (Op. xv. pp. 407–409.)

of the system of the earth's double motion was recognised by numerous learned men; and in 1696, when Newton published his immortal work, "Philosophiæ naturalis principia Mathematica," it became thoroughly established. All the scientific world who pursued the paths of free investigation accepted the Copernican system, and only a few ossified devotees of the old school, in common with some theological philosophers, still raised impotent objections to it, which have been continued even up to this day by some wrong-headed people.[1]

At Rome they only accommodated themselves to the new system slowly and reluctantly. In 1757, when it was no longer doubted by any one but a few fanatics, the Congregation of the Index thought the time was come for proposing to Pope Benedict XIV. to expunge the clause from the decree of 5th March, 1616, prohibiting all books which teach that the sun is stationary and the earth revolves. This enlightened pontiff, known as a patron of the arts and sciences, entirely agreed, and signified his consent on 11th May, 1757.[2] But there still remained on the Index the work of Copernicus, "De Revolutionibus Orbium Cœlestium," Diego di Zuñiga's "Commentary on the Book of Job" (these two works, however, only "donec corrigantur," but this was quite worthless for strict Catholics as far as the work of Copernicus was concerned, as since the announcement of these "corrections" by the decree of 15th May, 1620, no new edition had appeared), Foscarini's "Léttera sópra l'opinione de i Pittagorici e del Copernico della mobilità della

[1] For instance, Dr. Carl Schöffer, in his *brochure:* "Die Bewegungen der Himmelskörper. Neue and unbewegliche Beweise, dass unsere Erde im Mittelpunkte des Weltalls steht, und die Sonne, Mond und Sterne sich um dieselbe bewegen." Brunswick, 1854. ("The Motions of the Heavenly Bodies. New and indisputable proofs that our Earth is the centre of the Universe, and that Sun, Moon, and Stars, revolve round it").

[2] Habito verbo cum Sanctissimo, omittatur decretum, quo prohibentur omnes libri docentes immobilitatem solis, et mobilitatem terræ. (Olivieri, p. 94, or "Hist.-polit. Blätter," p. 585.)

Terra et stabilità del Sole, e il nuove Pittagorico Sistéma del Mondo," Kepler's "Epitome astronomiæ Copernicæ," and finally, Galileo's "Dialogo sopra i due Massimi Sistémi del Mondo." This last work had indeed been allowed to appear in the edition of Galileo's collected works,[1] undertaken at Padua in 1744, which had received the prescribed ecclesiastical permission; but the editor, the Abbot Toaldo, had been obliged expressly to state in an introduction that the theory of the double motion can and must be regarded only as a mathematical hypothesis, to facilitate the explanation of certain natural phenomena. Besides this, the "Dialogues on the Two Principal Systems" had to be preceded by the sentence on and recantation of Galileo, as well as by an Essay "On the System of the Universe of the Ancient Hebrews," by Calmet, in which the passages of Scripture bearing on the order of the world were interpreted in the traditional Catholic fashion.[2]

The celebrated French astronomer Lalande, as he himself relates,[3] tried in vain when at Rome, in 1765, to get Galileo's works expunged from the Index. The Cardinal Prefect of the Congregation of the Index objected that there was a sentence of the Congregation of the Holy Office in existence which must first be cancelled, but this was not done, and all remained as before; and even in the edition of the Index of 1819, strange to say, the five works mentioned above were to be found as repudiated by the Roman curia!

It then happened in the following year, 1820, that Canon Joseph Settele, professor of optics and astronomy at the Archive-gymnasium at Rome, wrote a lesson book, "Elementi d'astronomia," in which the Copernican system, in accordance

[1] "Opere di Galileo Galilei divise in quattro Tomi, in questa nuova edizione accresciute di molte cose inedite." In Padova, 1744. "Nella stamperia del Seminario appresso Gio. Manfrè," Tomi iv. in 4°.

[2] Comp. Olivieri, p. 96, or "Hist.-polit. Blätter," p. 587, and Op. xv. Bibliografia Galileiana, pp. xxvi., xxvii.

[3] "Traité d'astronomie" Paris, 1792, p. 421.

with the results of science, was treated *ex professo*. The Master of the Palace, Philip Anfossi, to whom in his capacity of chief censor of the press the book was submitted, demanded under appeal to the decree of 5th March, 1616, still in force, that the doctrine of the double motion should be only treated hypothetically, and refused the *imprimatur* until the MS. had been altered. Canon Settele, however, was not disposed to make himself ridiculous in face of the whole scientific world by compliance with these antiquated conditions, and appealed to Pope Pius VII., who referred the matter to the Congregation of the Holy Office. Here at last some regard was had to the times, and in the sitting of 16th August, 1820, it was decided that Settele might treat the Copernican system as established, which was approved by Pius VII. without hesitation. Father Anfossi could not, after this decision, prevent the work from publication as it was, but he resolutely pointed out the contradiction between this permission and the decree of 5th March, 1616, and published a treatise entitled: "Can any one who has made the Tridentine Confession, defend and teach as a thesis, and as an absolute truth and not a mere hypothesis, that the earth revolves and the sun is stationary?"[1] This gave rise to discussions in the College of Cardinals of the Holy Inquisition as to the attitude to be adopted by ecclesiastical authority towards the Copernican system, which had been universally adopted for more than a century. In the sitting of 11th September, 1822, they finally agreed, with express reference to the decree of the Index Congregation of 10th May, 1757, and 16th August, 1820, "that the printing and publication of works treating of the motion of the earth and the stability of the sun, in accordance with the general opinion of modern astronomers is permitted

[1] "Se possa difendersi ed insegnore, non come semplice ipotesi ma come verissima, e come tesi, la mobilità della terra e la stabilità del sole da chi ha fatta la professione di fede di Pio IV. quaestione teologico-morale."

at Rome."[1] This decree was ratified by Pius VII. on 25th September.

But full thirteen years more went by until, in 1835, when the new edition of the catalogue of prohibited books appeared, the five works in which the theory of the double motion was maintained and defended were expunged from the list.

It was not until 1835, therefore, that the last trace was effaced of the memorable warfare so long and resolutely waged by ecclesiastical power against the superior insight of science. If it is denied to history to surround the head of Galileo, the greatest advocate of the new system, with the halo of the martyr, ready to die for his cause, posterity will ever regard with admiration and gratitude the figure of the man, who, though he did not heroically defend the truth, was, by virtue of his genius, one of her first pioneers, and had to bear for her sake an accumulation of untold suffering.

[2] "Dichiarono permessa in Roma la stampa e la publicazione operum tractantium de mobilitate terrae et immobilitate solis, juxta communem modernorum astronomorum opinionem." (Olivieri, p. 97, or "Hist.-polit. Blätter," p. 588.)

APPENDIX.

APPENDIX.

I.

HISTORY OF THE VATICAN MANUSCRIPT.[1]

WE know next to nothing of the history of the Vatican MS. up to the time when Napoleon I. took possession of the papal city. During this period, when proud Rome had sunk so low as to be a department of France, in 1811, by the mandate of the then ruler of the world, the treasures of the Vatican archives were removed from Rome to Paris. Among them was the volume containing the Acts of Galileo's trial. It is not known how Napoleon's special attention came to be directed to them; but it is certain that he requested Alexander Barbier, then State Librarian, to furnish him with a detailed report about them.[2] Barbier handed it to the Minister of Worship and Instruction. He also proposed that the whole of the documents should be printed, in the interests of historical truth, in the original Latin and Italian, with a French translation. The proposal was approved by the Emperor, and the volume was handed over to Barbier that he might have the translation made.

When the convulsions of 1814 had swept Napoleon out of Paris, and transported him to Elba, and the Bourbons

[1] Somewhat abridged, as are also the Description and Estimate of the Vat. MS.—[TR.]

[2] See for this and what immediately follows, "Le Manuscrit Original du Procès de Galilée," par L. Sandret. *Revue des Questions historiques*, 1 Oct., 1877, pp. 551–559.

again ruled France, the Roman curia repeatedly took steps to regain possession of the volume.

After the return of Pius VII. to Rome in 1814, after his compulsory residence at Fontainebleau, Mgr. Marini was staying at Paris as Papal Commissary, in order to demand from the new French Government the restitution of the archival treasures taken by Napoleon from the Holy See. He first applied for the Acts of Galileo's trial to the Minister of the Interior, who referred him to the Count de Blacas, Minister of the Royal Household.[1] He assured Marini that he would have a search instituted in the royal library.[2] He wrote on the same day to Barbier charging him to search for the documents, and to report to him on their historical value.[3] Barbier's answer is too characteristic not to be given.

"A Son Excellence le Ministre de la Maison du Roi,

Paris, 5 Decembre, 1814.

Monseigneur,

Je m'empresse de répondre à la lettre par laquelle votre Excellence me fait l'honneur de me demander s'il existe, dans le dépôt général des bibliothèques de S.M. ou dans l'une de ses Bibliothèques particulières, des pièces qui faisaient partie des Archives Pontificales et qui sont reclamées par le garde de ces Archives, savoir le procès de Galilée.

Il y a plus de trois aus que je possède le procès de Galilée.

Rien n' est plus célèbre que ce procès dans l'histoire des Sciences et dans celle de l'Inquisition. Aussi s'en est on occupé avec un grand zèle jusqu' à ces derniers temps; ce qui est probablement cause qu' après l'avoir examiné avec tante l'attention qu'il merite, *je n'y ai remarqué ancun détail qui ne soit connu* (sic). L'importance de ce recueil consiste donc principalement dans la réunion des pièces qui ont motivé, dans le XVII^e^ siècle, la condamnation d'un habile astronome, pour une opinion qui est généralement enseignée aujourd'hui dans toutes les écoles, même ecclesiastiques.

Je suis, Monseigneur, etc.,

BARBIER."[4]

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[1] Marini, p. 144.

[2] Ibid. pp. 144, 145.

[3] See Sandret's Essays before cited, p. 553.

[4] Ibid. pp. 553, 554.

It is clear that Barbier expected to find support in the Acts of the trial for the assumed torture of Galileo; and as they reported nothing of the kind, and could not report anything consistently with the facts of history, the librarian entirely overlooked the vast importance of the papers. After this report Count Blacas felt no scruple about letting the Papal Commissary have them. On 15th December the minister wrote a note to Barbier, asking him for the volume of documents, that he might himself hand it to Marini.[1] He also wrote to the Papal Commissary that the documents had been found, and that it would give him great pleasure to deliver them to him.[2] Marini accordingly went three times to the minister's hotel, and once to the Tuileries, but without success. He therefore begged, in a letter of 28th January, 1815, to have a day and hour appointed for an audience.[3] To his dismay he received in reply a letter from Count Blacas of 2nd February, 1815, saying that the King himself wished to look through the trial of Galileo, that the MS. was in his majesty's cabinet, and therefore could not be given up immediately, but it should be done as soon as the King had returned it.[4]

Marini was therefore on the track of the documents, though he did not get them. But only twenty-four days after he received this explanation the famous hundred days occurred, and Louis XVIII. left his palace in the darkness of night for Ghent. Napoleon had scarcely set out for St. Helena, and the legitimate sovereign made his entry into Paris, than we find the Papal Commissary again eagerly trying to get back the precious MS.[5] But what must have been his dismay when he was informed by Count Pradel, temporary successor of Count Blacas, on 6th November, 1815, that the documents were no longer to be found

[1] Sandret, p. 554.
[2] Marini, pp. 145, 146.
[3] Marini, p. 146, 147; Sandret, pp. 554.
[4] Marini, p 147; Sandret, p. 555.
[5] Marini, p. 147.

in the King's cabinet, and that it was not known what had become of them.[1] Further efforts were fruitless. All that he could get from the French Government was the doubtful promise that the papers should be restored when found.

Two years later, in August, 1817, he again attacked Count Pradel on the subject,[2] and was assured that they were not in the cabinet of the royal palace; he might have a search made among the archives in the Louvre, they might have been put aside there.[3] Marini suspected that the papers had been purloined, and asked the minister of police, Count Decazes, to help him in his search. He, however, referred him to the Minister of the Interior,[4] that is, to the place where he had begun his inquiries three years before. Afterwards he applied to the president of the ministry, the Duke of Richelieu, and to the influential M. de Lainé, but with no more success than before.

In 1820 Venturi applied to Delambre, Secretary of the Academy of Sciences, with the request to get for him, if possible, extracts from and copies of the Acts of the trial, as he was urgently in want of them for the second volume of his "Memorie e lettere inedite fuora o disperse di Galileo Galilei." Delambre eagerly took up the question. Some light is thrown on the steps he took by the following note to Barbier of 27th June, only published a few months ago:—

"Le secretaire perpétuel de l'Académie pour les Sciences Mathématiques est venu pour avoir l'honneur de converser avec M. Barbier, sur un article intéressant de biographie astronomique, le procés de Galilée et les pièces originales dont M. Barbier a été longtemps dépositaire. Il desire cette conversation pour lui-même et pour M. Venturi, etc., Delambre."[5]

Three days later Delambre wrote to Venturi that the original Acts certainly had been at Paris some years ago,

[1] Marini, p. 147.
[2] Ibid. p. 148.
[3] Ibid. p. 148.
[4] Ibid. p. 151.
[5] Sandret, p. 556, note 1.

but had disappeared, and it was not now known whether they were still there or had been taken away. He told him that during the Empire the publication and translation of the documents had been projected, but political events had prevented it from being carried out; the extracts, however, then made, and the French translation which had been begun, were in existence. These, which M. Barbier had placed at Delambre's disposal, he sent to Venturi. Delambre expressed his great regret that the material which he could obtain was not complete; but he consoled himself with the opinion that by the publication of the documents in Riccioli's "Almagestum novum," 1651, and in the first volume of Venturi's work, nothing essential would be wanting; and "that unfortunate business, which would be ridiculous if it were not so repulsive, is now as widely known as can be desired." Delambre, as it seems, was only concerned with the clearing up of the torture question; and as the fragments which had come to his knowledge contained no evidence of torture, and as he might have been informed by Barbier that there was no trace of it in any of the papers, he wrote as above in calm conviction to Venturi.

Eight years afterwards Count Darü, who was intending to bring out his work on astronomy, made inquiries of Barbier about the existence of the Acts of Galileo's trial. The information he received must have been wholly unsatisfactory, as appears from the following letter from the Count to Barbier of 16th October, 1828:—

"J'ai reçu Monsieur . . . les deux lettres que vous m'avez fait l'honneur de m'écrire. J'ai trouve, joint à la seconde, le billet de M. l'abbé Denina[1] qui prouve que la traduction du procès de Galilée a existé au moins en partie. Du reste, nous en avions déjà la preuve par l'extrait de M. Delambre. *Je suis persuadé que le procès existe quelque*

[1] Denina was at Paris from 1805 till his death in 1813, and may therefore have seen the Acts, which were in Paris from 1811, as well as the translation which was begun.

part à Paris, et ce me semble, il doit se trouver dans quelque bibliothèque du roi, peut être même aux Archives de la liste civile. J'en parlerai a M. le baron de la Bouillerie.

Recevez, etc.,
DARÜ." [1]

But Darü's further inquiries seem to have been unsuccessful; anyhow, the long-sought-for volume remained concealed for seventeen years longer. In 1845 Gregory XVI. requested Pelegrino Rossi, French ambassador at Rome, who was devoted to the papacy, to use his influence to get the Acts restored, if they should be discovered at Paris. This shows that it was disbelieved at Rome that they could not be found. At first Rossi's urgent mediation only obtained the assurance from Louis Philippe that the Pope's cherished wish should be fulfilled, provided that the papers should be found, but on the express condition that they should be published entire at Rome. And as the curia, of course, promised to comply, the MS. which had been mysteriously concealed for thirty-one years was "found" and restored.

In 1848–9, when the Papal See was attacked by the revolutionary spirit which pervaded Europe, the fugitive Pope, Pius IX., confided the hardly-won documents to the prefect of the Secret Archives, Marino Marini. He not only took good care of them, but took the opportunity of fulfilling the obligation to the French Government incurred on their restoration. On 12th April, 1850, the Pope returned from Gaeta to his capital under the protection of French bayonets, and his thoughts must soon have recurred to these documents, for on 8th May of the same year he presented them to the Vatican Library. In the same year, also, Marini's work, "Galileo Galilei e l'Inquizione," appeared at Rome, intended to be the fulfilment of the French conditions.

We purposely say "intended to be," for they were not

[1] Sandret, pp. 556, 557.

really so at all. The entire contents of the Vatican MS. were thereby by no means given to the public, but such a sight of it as the editor thought proper, and which was, as far as possible, an apology for the Inquisition. Instead of the full original text of the Acts, the world only received disjointed extracts, arbitrary fragments—in many instances nothing at all. Perhaps it was perceived at head-quarters that a comparison of Marini's work with the documents would bring strange things to light, for they were suddenly removed from the too public Vatican Library and placed among the papal archives.

And for a long time there seemed to be no disposition to place these important historical materials at the disposal of independent historians. Thus we learn from Albèri, editor of "Le Opere di Galileo Galilei," Florence, 1842–1856, in 16 vols., in which all the materials for the history of Galileo are collected, that Marini had made obliging offers to him about the Vatican MS.; but his death put an end to the hopes thus raised, and Albèri had to content himself with reproducing the extracts and documents given by Venturi and Marini. It is obvious that the MS. was not accessible to him, or he would surely have included the Acts in his great work. Professor Moritz Cantor, who asked to see them ten years later, met with no better success. He complains bitterly in his essay, "Galileo Galilei," that the attempts he made through the good offices of an eminent *savant*, with Father Theiner, keeper of the Secret Archives, had been without avail.

However, though neither Albèri nor Cantor attained their wish, Henri de L'Epinois, a few years later, was more successful. In the introduction to his work, "Galilée, son procès sa Condemnation," 1867, he relates that in a conversation with Theiner at Rome, he expressed his regret at the inadequacy of Marini's book, and his desire to see the subject of Galileo's trial cleared up. Theiner liberally responded to this appeal by placing the documents at his disposal.

But Epinois had only just made hasty copies of the most important, and indices of others, when he was compelled by urgent private affairs to return to France. The copies of the Vatican MS. which he took with him were therefore in many respects inaccurate and incomplete, and even the indices left much to be desired. Nevertheless, historical research will always be indebted to Epinois for publishing his notes, in spite of their shortcomings, which were best known to himself.[1] The melancholy picture of Galileo's trial was first presented in faithful outline, and it became possible to weave the story with approximate accuracy. Many details, however, were still wanting; and though the fictitious stories of many writers were considerably checked by Epinois's communications, some scope was still left for them. What was wanted was the entire publication of the Vatican MS., and if possible with diplomatic precision.

Nine years again went by, during which Epinois seems to have found no opportunity of completing his work. Meanwhile, Professor Domenico Berti asked for the favour of a sight of the papers, and in 1876 he was engaged in Theiner's room in copying the documents.[2] In the same year his work, "Il Processo Originale di Galileo Galilei," appeared, bearing upon the title page the unwarranted addition, "publicato per la prima volta da Domenico Berti." Epinois had been the first to publish the Vatican MS., though only partially; the words would only have been correct if Berti had published them complete. This he professes to have done,[3] but as five documents are wanting, and the contents of fifty others only shortly given, it cannot be regarded as complete.

[1] *Revue des questions historiques*, Paris, July, 1867.

[2] . . . "e avemmo fra le mani il desiderato volume nella stanza del padre Theiner testè rapito dolorosamente ai vivi." ("Il Processo Originale," etc., p. x.)

[3] "Egli è adunque per la prima volta che i due processi Galeleiani sono publicati nella loro integrità." Page xii.

Besides these unfortunate lapses, Berti's publication is very disappointing to the historian. Instead of giving the reader as good an idea as possible of this interesting MS., the documents are taken out of all connection, and given numbers and superscriptions of which there is not a trace in the original, and the marking of the folios is omitted. "Improvement" of the orthography, punctuation, etc., is consistently carried out. One of the numberings is quite left out (the oldest, upper paging), and, following Epinois, he reads the second incorrectly.

In the same year in which Berti's book appeared, Sante Pieralisi received an invitation from high quarters to inspect the volume. He accepted the flattering offer with no small satisfaction, but does not seem to have known how to turn it to account. He confined himself to comparing the most important documents in Epinois and Berti with the originals, and to giving a list, by no means complete, of their deviations from them.[1]

In consequence of the controversy as to the genuineness of the document of 26th February, 1616, we resolved in the spring of 1877 to attempt to get a sight of the papers, our sole reason being the desire to see for ourselves whether external evidence was for or against falsification, or whether any certain conclusions could be drawn from it. We had then no idea whatever of publishing the Vatican MS. ourselves, as we at that time considered Berti's publication of it to be nearly complete.

Through the good offices of the Austrian ambassador, we were promised that when we came to Rome, Cardinal Simeoni, Secretary of State, would permit us to see the documents. Two days afterwards we were on our way to Rome, and soon had the volume in our hands. As we

[1] See "Correzioni al libro Urbano VIII. e Galileo Galilei proposte dall' autore Sante Pieralisi con osservazioni sopra il Processo Originale di Galileo Galilei publicato da Domenico Berti." Roma, 30 Settembre, 1876, pp. 9-16.

turned over the pages with a curiosity easy to be imagined, and compared it with Berti's publication, we discovered, to our no small surprise, its many omissions and inaccuracies. The idea then occurred to us of making a copy of all the documents in the collection with the greatest possible precision. Not the least "improvement" should be made; the text should be reproduced exactly, with its peculiar orthography, accentuation, and punctuation, its abbreviations, errors, and special marks, so far as it was possible by means of typography.

We made known our intention to the first prefect of the Vatican Library, Mgr. Martinuzzi, to whom Cardinal Simeoni had referred us; he not only made not the slightest objection, but showed great interest in our project. During our long daily tarriance in the Vatican afterwards, he was most obliging, and heaped attentions upon us which lightened the labour.

We might have been engaged about three weeks in copying the MS., sending the pages copied during the day to Messrs. Cotta, at Stuttgard, to be printed, when we were surprised one morning by a visit in the Vatican from M. de L'Epinois. He told us that he had been two months at Rome, and had undertaken a correction of Berti's book from the original. We informed him of our enterprise, which he spoke of as "quite a different thing"; and when we returned his call, he again spoke of a correction of Berti, and regretted that he had not copied the whole MS. Of any intention of publishing it complete he said not a word. We therefore contentedly went on with our work; the copying was nearly finished and the printing in progress, when one afternoon on our return from the Vatican we found a letter from Epinois, in which he said that he had not had time to call on us again, and informed us of the speedy appearance of his complete publication of the Vatican MS., and that we should receive a copy in a few days. This announcement was most surprising.

We went at once to seek M. de L'Epinois, but learnt that he had left Rome early that morning.

Our work was too far advanced to be given up, and so we went on, in the hope that even now there might be some little place in the world for it. By the time Epinois's book reached us the copying was finished, and we were correcting the proofs by the originals. It was not without value, even for our enterprise, for we compared our proofs with it line by line and word by word, made notes of deviations, and then went to the Vatican to see which was right. We readily acknowledge that in this way we discovered and corrected many errors which had crept into our copy. The variations which still exist are all well known to us, and are left, either because Epinois is mistaken, or we consider our reading to be the best. This is not the place for a criticism of his work; we will only bear witness, after comparing it with the original, to its accuracy.

II.

DESCRIPTION OF THE VATICAN MANUSCRIPT.

THE Acts of the two trials of Galileo, of 1615–16 and 1632–33, which are stitched together, and to which several other documents are added relating to the surveillance of Galileo until his death, and the erection of his monument, form a pretty thick quarto volume, twenty-two centimeters broad and thirty high.

It is done up in a loose sheet of white paper, which can lay no claim to veneration from age, and is in an equally loose green pasteboard cover, which may boast of historic antiquity, as may also the faded and frail red strings by which the volume is fastened. The cover is too short and too narrow, so that the edges get mercilessly rubbed. In this way, unfortunately, many a letter, word and even signature in these precious papers have been lost, and it is high time to protect them from further injury.

The documents are only slightly fastened together in places, and you can see from the outside how far the Acts of the first trial extend. This slight fastening also enables you to see that all the blank pages, of which there are 194, are partly reverse sides, partly second pages of documents, and it may easily be discovered to which document each blank page belongs. In some cases these second pages have been cut away, as appears from the broad piece left. The suspicion from this that important documents have been withdrawn seems inadmissible, for the pages cut out, as is seen from those left, which correspond with the rest, belonged to finished documents, and the abstraction

of a document would certainly not have been betrayed by leaving a broad strip behind.

The paging is in the greatest confusion. On the title page, in the right hand corner, are the figures 949, and under them 336. The historical introduction, by an unknown hand, prefixed to the papers, is numbered 337–340. The first document bears the double paging $\frac{950}{341}$, the upper number being struck through. On folio $\frac{951}{342}$ a third paging begins with 1, on the right hand lower edge. The triple numbering goes on regularly to $\frac{959}{350}$. After $\frac{992}{383}$ the uppermost and oldest paging is discontinued. Folios 384–386, blank pages of the Acts of the first trial, only bear the double paging, probably because, being blank, they were not paged until the papers of both trials were put together.

The double paging may be thus explained. The old numbering comprises all the documents belonging to 1616; and as it is to be seen on the title page, as well as the words: "Ex archivo S. Offij," and Vol. 1181, it is clear that these documents were originally comprised in a volume of the Archives of the Holy Office numbered 1181. The Acts of the second trial, 1632–33, must have belonged to another volume, as appears from the paging, as the first document bears the number 387, but the number of the volume is not traceable. When the Acts of 1616 and 1632–33 were bound together, in order to form a continuous paging, the old numbers of the first trial were struck through, and the paging continued backwards, reckoning from the first folio of the second trial.

The Introduction helps to determine the time when the two parts were united. It only extends to the mention of Galileo's defence; it is clear, therefore, that it was written after 10th May (the date of the defence), and before

21st June, the date of the last examination, while the numbering, which is that of the second paging only, shows that the union had taken place. The title page also is included in the second paging. We may therefore conclude that the authorship of the Introduction and the joining of the Acts up to 10th May, 1633, is to be attributed to the same person.

The object of this report undoubtedly was to give the Pope and Congregation, before their final verdict on Galileo, a *résumé* of the whole affair from its beginning. The united Acts were the vouchers. The drawing up of such a *résumé* was part of the ordinary proceeding in every trial before the Inquisition, and it had to be circulated among the cardinals and qualifiers before the final sitting.[1] As in Galileo's case this final sitting took place on 16th June, under the personal presidency of the Pope, it is in exact agreement with this that both the summary and paging referred to in it only extend to the events of 16th June.

As to the addition of the further documents, it may be observed that after the papers were put together the collection ended with six second pages, of which four, 448, 449, 450, 451, belonged to the opinion of Pasqualigus; and two, 452, 453, to the protocol of the examination of Galileo of 12th April, 1633. The annotation about the decree of 16th June, 1633, was written on the reverse side of the last second page, 451, forming part of the above-named document, and the three previous pages were left blank. The protocol on the Constitute of Galileo of 21st June was written on the blank sheets of 12th April. On the re-

[1] "Quando si havra a terminare qualche causa al S. Off. appartenente converra, che prima ai formi il caso in cui brevemente si ristringano ineriti della causa e tutti i punti substantiale del processo, etc. . . . Poscia mandatalo a ciascuno de Sig Consultori entrera con esso loro opportunamente nella Congregatione," etc. ("Sacro Arsenale," etc. Bologna, 1665. Masini's ed., pp. 345, 346).

maining space (half of 453 and the reverse side) two notes were made—the first about the mandate of 30th June, to send the sentence and recantation to all Inquisitors, etc., and the permit to Galileo to go to Siena; the second note reports that Firenzuola issued the order to Galileo on 2nd July. The rest of the documents which the Vatican MS. now contains must have been added as they came in, or when there were several to be added. The paging was, of course, continuously carried out.

The last document but one of the collection is a short historical summary of the process. Berti says that this must have been drawn up at least a year after its conclusion,[1] but Pieralisi[2] has pointed out that he should have said, at least a century. The origin of it is plain: when the inquiry of Fra Paolo Antonio Ambr*** of 8th June, 1734, came in as to the erection of a monument in Santa Croce, this *résumé* was drawn up to put the cardinals, who might not know much about it, in possession of the chief facts of Galileo's trial. In the Vatican MS. the sheet of paper containing the *résumé* is stitched to the letter of Fra. Ambr*** and the decision of the cardinals written on the fourth page. If any doubts remain that this summary was written in 1734, they will disappear on comparing it with the extracts, published by Gherardi, of the protocol of the sitting of 16th June of that year. In this we find, within parentheses, the most important part of the summary, followed by the decision of the cardinals, in almost verbatim translation from Italian into Latin. The date and purpose of the summary are therefore made clear.

"[1] Il Processo originale di Gal. Galilei," etc. Rome, 1876, p. 138, note 1.

"[2] Correzioni al libro Urbano VIII. e Gal. Galilei," etc. Rome, 1876, pp. 44-46.

III.

ESTIMATE OF THE VATICAN MANUSCRIPT.

WE now proceed to the examination of the documents contained in this famous volume. They differ in historical value, for they are not all as Professor Berti says,[1] original documents, but often copies, and more or less cursory annotations. Those only can be considered original documents which have autograph signatures; as all the letters in the MS. with one exception,[2] the protocol of the examination of Caccini, and the protocols of the examinations of Galileo; those of the depositions of Ximenes and Attavanti are copies sent by the Inquisitor at Florence to the Holy Office, and there is therefore no question of their authenticity. The rest of the MS. consists mainly of annotations on the decrees relating to the trial, decrees and mandates of the Pope and Holy Congregation, or notices of their execution. *But the original Acts corresponding with these annotations are not comprised in the Vatican MS.* Moreover, a careful examination of the Vatican Acts with Gherardi's Documents shows, that especially after the conclusion of the trial till Galileo's death, many papal decrees were issued of which there is no mention in the Vatican MS. So far as this, therefore, it must be looked upon as an incomplete source. But on the other hand, there is no doubt that the Acts of the trial itself lie before us altogether.

[1] "Il Processo originale di Gal. Galilei," etc., p. v.

[2] The Denunciation of Lorini. The signature, however, obviously once existed, but being on the edge of the paper has been effaced in the course of time.

Dr. Emil Wohlwill, of Hamburg, has recently expressed the suspicion that a short time before the MS. was removed from the Archives of the Holy Office to France, the Acts of the trial underwent alterations with a special purpose, in the expectation that the Archives would be robbed, and that after the return of the volume in 1846, through Mgr. Marino Marini, Prefect of the Papal Archives, these alterations were completed![1] Wohlwill takes all the preliminary report—the origin of which is clear, and in accordance with the rules of the Inquisition—for a forgery intended to influence "readers outside the Vatican." He also thinks that the opinion of the qualifier of the Holy Office at the head of the Acts is a later addition. The object of this no one can make out, and Dr. Wohlwill himself can give no satisfactory reason for it. As he had only Epinois's first edition of the Vatican MS. (1867), and Berti's imperfect publication in his hands, he often draws incorrect conclusions. It is hardly necessary to say that Dr. Wohlwill's bold conjectures turn out to be phantoms on an actual examination of the papers, and this will certainly be confirmed by Epinois, Berti, Pieralisi, and all who have seen them. This is not the place to refute Wohlwill's suspicions, as we have done so elsewhere.[2] It only remains for us to give the material evidence which indisputably proves that the annotation of 26th February neither is nor can be a later falsification.

As is well known, before we had inspected these documents we had fully adopted the suspicion, expressed by Dr. Wohlwill in Germany, and Professor Gherardi in Italy, that the "document" of 26th February, 1616, was of a later origin, in order to afford a pretext, according to the ideas of the time, for bringing the inconvenient author of the "Dialogues on the Two Systems" to trial for disobedience to an order of the Sacred Congregation, though

[1] "Ist Galilei gefoltert worden." Von Emil Wohlwill. Leipzig, 1877.

[2] "Ist Galilei gefoltert worden." Gegenbetrachtungen von K. v. Gebler. Die Gegenwart.

the work seemed to be protected by the ecclesiastical *imprimatur*. We confess that we went to Rome with but little hope of finding external evidence for or against the genuineness of the document. It had been long in Professor Berti's hands, and he had defended it with learned dialectics, while the controversy would have been closed by adducing material evidence. It seemed to us, therefore, sufficient inducement to undertake a journey to Rome, if it should enable us to confirm, on external grounds, that the document was not a falsification, even though its genuineness might not be capable of demonstration.

Contrary to all our expectations, after a repeated, careful, and we may say, entirely objective examination, we must pronounce *that the suspicion of a later origin is not tenable.*

Now for the reasons. The note of 26th February begins on the same page as that of the 25th, and they are in precisely the same ink and handwriting. As, however, in case of a forgery, the perpetrator would not have been so unskilful as to add a note in different ink and writing under another sixteen years old, but would have written both on another sheet, and carefully incorporated them with the Acts, we had to find out whether it was possible that the pages on which the notes are found (folios 378 vo. and 379 ro.), could have been afterwards added to the Acts. This was found to be impossible. It is excluded by two circumstances.

1. Folios 378 vo. and 379 ro. are *second* pages to existing documents; and folio 378 belongs to 377, on which is written the famous opinion of the Qualifiers of the Holy Office on the two propositions of Galileo, taken from the work on the Solar Spots. Folio 379 again belongs to folio 357, which is a page of the protocol of the examination of Caccini.

2. In this collection of the Acts of the trial, all the paper on which the documents of the Holy Office were written at Rome, bears the same watermark,—a dove in

a circle,—which is not found on any of the paper of later date. This mark is distinctly visible on the folios bearing the notes of 25th and 26th February.

As from this evidence the idea of a later insertion of the papers had to be given up, there was still one suspicion left—that the two notes had been written in 1632 on blank sheets of Acts of 1616, of which there are so many, and the authentic notice of 25th February removed. But this hypothesis could not be maintained in face of the fact that, as a scrupulous comparison showed, several other annotations of 1616 are in the same hand as those of 25th and 26th February, while it is not to be found in any document of the later trial.

In the face of these decisive facts it seems no longer justifiable to maintain that the note of 26th February is a *later* falsification. Nevertheless, Professor Moritz Cantor, of Heidelberg, has conjectured, and Dr. Scartazzini has told us for certain, how the "falsifiers" went to work. In the *Revista Europea*, vol. iv. part v., 1st December, 1877, Dr. Scartazzini propounds his theory with an effrontery which is most convincing to a layman and astounding to the initiated. And yet it is entirely upset by one simple practical observation. His theory is that the page on which the genuine protocol of the proceedings of 26th February was written was cut out, that this was concealed by folding the edge the other way, while space was found for the existing forgery by transposing blank sheets. Now for our observation: Dr. Scartazzini quotes only the second paging, which was done *after* the assumed forgery, and it therefore permitted a transposition of pages according to the pleasure—not of the forger, but of Dr. Scartazzini. In 1632 there was a regular numbering from 949–992, originating in 1616, and no transposition of the Acts could have been made on Scartazzini's plan, without entirely disturbing it. His theory therefore belongs to the realm of impossibilities.

But firmly as it is now established that the document of

26th February, 1616, is not a later forgery, it is equally certain that the proceedings did not take place in the rigid manner described in that annotation. In the course of this work we have become acquainted with the various reasons which conclusively prove that the annotation contains a downright untruth, exaggeration, or misrepresentation. To all these reasons one more may now be added. Had the course of events been that recorded in the annotation, so important an act would have been made into a protocol, and would have been signed by Galileo, the notary, and witnesses. Only a document of this kind would have afforded conclusive evidence on another trial. We learn from another document of the trial that such a proceeding was a part of the precautionary measures of the Inquisition, in order that the accused might not be able to deny what had happened. When on 1st October, 1632, Galileo was summoned before the Inquisitor at Florence, who issued the command to him to present himself at Rome in the course of the month, Galileo had to state in writing that he had received the order and would obey it; no sooner had he left the room than it was entered by a notary and witnesses who had been concealed in an adjoining apartment, and affirmed under Galileo's signature that they had been present when he "promised, wrote, and signed the above."[1]

If these measures were so strictly observed in the case of this much less important act, we may be tolerably certain that they would not have been omitted in the far more important one of 1616, if the stringent command had really been issued to Galileo by the Commissary-General in the name of the Pope and the Holy Congregation, before notary and witnesses, to maintain henceforth absolute silence, in speaking and writing, about the Copernican system. Such a document would have furnished the Holy Office with legal grounds for bringing Galileo to trial in case of his breaking his word, and for punishing his dis-

[1] Vat. MS. fol. 398 ro.

obedience; in short, for subjecting him to the consequences of this categorical injunction.

Did such a protocol ever exist? As we doubted the fact of the stringent intimation, we did not believe that such a document ever had existed. Nevertheless, when at Rome, we eagerly sought to discover whether, contrary to all expectation, this most important document was extant, or to learn anything about it. It might perhaps be in the Archives of the Holy Inquisition, in which, in 1848, Professor Gherardi had found such valuable notes about the trial of Galileo. We therefore addressed a memorial to the then Secretary of State, Cardinal Simeoni, in which we made a concise statement of the present state of the researches relating to Galileo's trial, remarking that though the suspicion of a falsification was not tenable, the correctness of the note of 26th February seemed doubtful, and could only be acknowledged as trustworthy if either the original protocol, or some confirmatory notice, were discovered in the Archives of the Inquisition. In the course of four weeks we received the following reply:—

"Illmo Signore,

In seguito della richiesta fattasi da V. S. Illma di avere dei documenti relativi a Galileo, mi recai a premura di commetterne le opportune indagini. Praticatesi le più diligenti ricerche, vengo informato non esistere affatto negli Archivi i documenti che si desideravano.

Nel portare ciò a sua notizia, ho il piacere di dichiararle i sensi della mia distinta stima—

Di V. S. Illma,

Affmo per servirla,

"Roma 20 Luglio, 1877. GIOVANNI CARD. SIMEONI."

By this decisive information it is established that *now*, at any rate, *no other document is extant relating to the proceedings of* 26th *February*, 1616, *than the well-known annotation.* Was this also the case in 1632, when Galileo was arraigned for disobedience and signally punished? The history of the trial, the otherwise incomprehensible attitude of the Interrogator towards Galileo, are strongly in favour of an affirmative

answer. From his first examination to his defence, Galileo persistently denies having received any other command than the warning of Cardinal Bellarmine, neither to hold nor defend the Copernican doctrine, while the Interrogator maintains that a command was issued to him before a notary and witnesses "not in any way to hold, teach, or defend that doctrine." The contradiction is obvious. In confirmation of his deposition, Galileo brings an autograph certificate from Cardinal Bellarmine which fully agrees with it. One would then have expected to see the Interrogator spare no pains to convict Galileo on this turning-point of the trial. The production of a legal protocol about the proceeding of 26th February would have cleared up the whole affair and annihilated Galileo's defence. But as it was not produced, and the Interrogator, singularly enough, omits all further inquiry into Galileo's ignorance of the absolute prohibition, and simply takes it for granted, we may conclude that in 1633 no other document existed about the Act of 26th February than this note without signature. It must therefore be admitted by the historical critic that one of the heaviest charges against Galileo was raised on a paper of absolutely no legal value, and that sentence for "disobedience" was passed entirely on the evidence of this worthless document.

IV.

GHERARDI'S COLLECTION OF DOCUMENTS.

IN the course of this work we have always acknowledged the authenticity of the documents first published by Gherardi in his "Il Processo Galileo: Riveduto Sopra documenti di nuove fonte," in the *Rivista Europea*, vol. iii., 1870, and our story has in many cases been based on them. It behoves us, therefore, to give the reasons which place their authenticity beyond question. These are to be found, first, in the origin of the collection; secondly, by comparing the documents with others universally acknowledged to be authentic.

On the first point we refer to the professor's account prefixed to the documents. In December, 1848, he came to Rome, and was at first, though only for a short time, deputy to the parliament summoned by Pius IX., then held, in quick succession, the offices of member of the assembly for framing a constitution, Secretary of State, and finally Minister of Instruction to the Revolutionary Government. These offices greatly facilitated Gherardi's historical researches, and he pursued them with ardour even amidst the turmoil of revolution. His attention was specially directed to the discovery of the original documents of Galileo's trial. Even in December, 1848, he found opportunity to make a search in the Archives of the Palace of the Inquisition, which was carefully guarded by the soldiers and agents of the Provisional Government to save these historical treasures from the fury of the mob. Gherardi had hoped to get a sight of the complete collection of the Acts, which had two years before been brought back from Paris. But this hope was not fulfilled, for as we know, during the Revolution, these documents were

in the hands of Mgr. Marino Marini, Prefect of the Secret Archives. So Gherardi had to content himself with seeking more or less evident traces of the trial among the Archives left in the greatest confusion and partly hastily plundered by the fugitive custodians. It was not without difficulty that he discovered, what was before unknown, that the Acts of the Inquisition were divided into two classes: the first contains the protocols of the sittings and decrees of the Holy Congregation, sometimes in full and sometimes merely extracts. The folios containing these were marked Decreta. The second class contains the protocols of the examinations of accused persons and witnesses, all Acts relating to trials, and finally the sentences passed. These folios were marked Processus. There was a third register marked Rubricelle, which served as an index to everything relating to any person or cause.

As there were not nearly so many gaps in the Decreta as in the Processus, Gherardi turned his attention, the Rubricelle in hand, to the former. He began to make extracts from the documents relating to Galileo's trial, and had already made ten, when he came upon a collection of papers containing thirty-two of such extracts, all relating to the trial. To these papers was added an extract from a letter from Count Blacas, from Prague, of 20th January, 1835, in which he stated that he had repeatedly, but without success, instituted a search for the Acts of Galileo's trial, which had been detained at Paris since 1815, and that nothing would give him greater pleasure, should they come into his hands, than to deliver them to his Holiness, but this was not a suitable time to renew the demand for them.

It is clear from this letter that the curia made at least one attempt to regain possession of the Vat. MS. between 1820 and 1845, and Gherardi concludes from the circumstance that this letter was found with the said collection that a copy of it had been sent to the Count, perhaps to show him that it was desired to put all the papers re-

lating to Galileo's cause together—a project intended to urge the Count to renewed efforts for their recovery. Be that as it may, the important thing is that Gherardi, having convinced himself of the entire agreement of his ten extracts (the most important), with the corresponding ones in the collection, concluded that the other twenty-two were correct, and did not make any more extracts.

In April, 1849, in spite of the precautions taken, the Archives of the Inquisition seemed no longer safe from the mob, and were removed, with other ecclesiastical libraries, to the Apollinarius church, where Gherardi was again able to look at them. But it was but for a moment, as he decidedly declined all responsibility for a collection of such immense historical value. Moreover, the advance of the French army to Rome to effect the restoration of Pius IX., would have left him but little time for historical researches. On 4th July, in consequence of the capitulation of the municipal council, the French General Ouidinot marched at the head of his troops into "liberated" Rome, while Garibaldi left it on the other side with his 4000 volunteers, and with him all the patriots who had specially distinguished themselves in the service of the Republic during its short existence. Among these was Gherardi, who turned his steps towards Genoa, where he lived for his studies during his exile. On leaving Rome he had only been able to take ten extracts with him, and had now to wait for an opportunity of completing them by those in the Archives of the Inquisition, and he waited patiently twenty-one years. In 1870 the time at length came. He gives us no further particulars as to how he succeeded in getting the collection into his hands again, but simply says that he did so, and no longer delayed to give this valuable historical material to the world.

The history of Gherardi's Documents is of itself a pledge of their authenticity, and it is absolutely confirmed by comparing them with the corresponding documents of the Vatican

MS. We have compared them line for line and word for word, and have found that they contain nothing whatever that in the least diverges from those Acts. On the contrary, they throw light on and complete them, and in some cases agree with them verbatim—perhaps the best possible proof of the authenticity of both.

V.

989.
Fol. 380
ro. 38

DECRETVM [1]

Sacræ Congregationis Illuſtriſsimorum S.R.E. Cardinalium, à S.D.N. PAVLO Papa V. Sanctàq. Sede Apostolica ad Indicem Librorum, eorumdemq; permiſsionem, prohibitionem, expurgationem, et impreſsionem, in vniuerſa Republica Chriſtiana ſpecialiter deputatorum, vbiquè publicandum.

CVM ab aliquo tempore citra, prodierint in lucem inter alios nonnulli Libri, varias hæreſes, atq; errores continentes, Ideo Sacra Congregatio Illuſtriſsimorum S. R. E. Cardinalium ad indicem deputatorum, nè ex eorum lectione grauiora in dies damna in tota Republica Chriſtiana oriantur, eos omninò damnandos, atque prohibendos eſſe voluit; Sicuti præſenti Decreto pœnitus damnat, et prohibet vbicumq; et quouis idiomate impreſſos, aut imprimendos. Mandans, vt nullus deinceps cuiuſcumque gradus, et conditionis, ſub pœnis in Sacro Concilio Tridentino, et in Indice Librorum prohibitorum contentis, eos audeat imprimere, aut imprimi curare, vel quomodocumque apud ſe detinere, aut legere; Et ſub ijſdem pœnis quicumque nunc illos habent, vel habuerint in futurum, locorum Ordinarijs, ſeù Inquiſitoribus, ſtatim à præſentis Decreti notitia exhibere teneantur, Libri autem ſunt infraſcripti, videlicet.

Theologiæ Calviniſtarũ Libri trés, auctorè Conrado Schluſſerburgio. | *Scotanus Rediuiuus, siue Comentarius Erotematicus in tres prio-* | *res libros, codicis, &c.*

Grauiſsimæ quæſtionis Chriſtianarum Eccleſiarum in Occidentis, | *præſertim partibus ab Apostolicis temporibus ad noſtram vſque* | *ætatem continua ſucceſsione, &c. ſtatu: hiſtorica explicatio, Au-* | *ctore Jacobo Vſſerio Sacræ Theologiæ in Dulbinienſi*[2] *Academia* | *apud Hybernos profeſſore.*

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[1] This decree is given in a printed copy in the volume containing the Vat. MS. We give it on a reduced scale.

[2] Misprint for *Dubliniensi.*

Federici Achillis Ducis Vuertemberg. Conſultatio de Principatu | inter Provincias Europæ habita Tubingiæ in Illuſtri Collegio | Anno Chriſti 1613.

Donnelli Enucleati, ſiue Commentarium Hugonis Donelli, de Iure | Ciuili in compendium ita redactorum &c.

Et quia etiam ad notitiam præfatæ Sacræ Congregationis peruenit, falſam illiam doctrinam Pithagoricam, diuinæq; ſcripturæ omnino aduerſantem, de mobilitate Terræ, et immobilitate Solis, quam Nicolaus Copernicus de reuolutionibus orbium cœleſtium, et Didacus Aſtunica in Job etiam docent, iam diuulgari et à multis recipi; ſicuti videre eſt ex quadam epiſtola impreſſa cuiuſdam Patris Carmelitæ, cui titulus, Lettera del R. Padre Maeſtro Paolo Antonio Foſcarini Carmelitano, ſopra l'opinione de Pittagorici, e del Copernico, della mobilità della Terra, e stabilità del Sole, et il nuouo Pittagorico Sistema del Mondo, in Napoli per Lazzaro Scoriggio 1615. in qua dictus Pater oſtendere conatur, præfatam doctrinam de immobilitate Solis in centro Mundi, et mobilitate Terræ, conſonam eſſe, veritati, et non aduerſari Sacræ Scripturæ: Ideo nè vlteriùs huiuſmodi opinio in perniciem Catholicæ veritatis ferpat, censuit dictos Nicolaum Copernicum de reuolutionibus orbium, et Didacum Aſtvnica in Job, ſuſpendendos eſſe donec corrigantur. Librum verò Patris Pauli Antonij Foſcarini Carmelitæ omninò prohibendum, atque damnandum; aliosq; ; omnes Libros pariter idem docentes prohibendos, Prout præſenti Decreto omnes reſpectiuè prohibet, damnat, atque ſuſpendit. In quorum fidem præſens Decretum manu, et ſigillo Illuſtriſſimi & Reuerendiſſimi D. Cardinalis S. Cæciliæ Epi Albaneñ signatum, et munitum fuit die 5. Martij 1616.

P. Epiſc. Albanen. Card. S. Cæciliæ.

Locus † ſigilli. *Registr. fol.* 90.

F Franciſcus Magdalenus Capiferreus Ord. Prædic. Secret.

ROME, Ex Typographia Cameræ Apostolicæ. M.DCXVI.

VI.

REMARKS ON THE SENTENCE AND RECANTATION.[1]

WE give the Sentence and Recantation as given by Giorgio Polacco in his work, "Anticopernicus Catholicus seu de terræ Statione, et de salis motu, contra systema Copernicanum, Catholicæ Assertionis," pp. 67–76, Venice, 1644. Everything indicates that these are the only authentic copies of the originals, while the opinion adopted by many authors that the Latin texts published by P. Riccioli in his "Almagestum Novum," 1651, are the originals, is not tenable on close examination, for it is obvious that they are translated from the Italian. According to the rules of the Inquisition, sentences and recantations were written in the mother tongue,[2] that they might be generally understood. P. Olivieri, General of the Dominicans and Commissary of the Inquisition, also says in his posthumous work, "Di Copernico e di Galileo," Bologna, 1872, p. 62, "We find the history of it, etc., in the sentence passed on Galileo, which is given in many works in a Latin translation. I take it from Venturi, who gives it in the Italian original."

Professor Berti, in his "Il Processo originale di Galileo Galilei," etc., pp. 143–151, has given the Sentence and Recantation in a Latin text which agrees precisely with Riccioli's, even in some misprints. He says that they are taken from some MS. copies in the Archivio del Santo, at Padua, and thinks that they are the very copies sent by the Cardinal

[1] Abridged. [TR.]

[2] Cæsar Carena: "De officio Sanctissime Inquisitionis et modo procedendi in causis fidei." Cremona, 1641, p. 416.

of St. Onufrio, at the command of the Pope, to the Inquisitor at Padua in 1633. Incited by this remark, when at Padua we went to inspect these valuable MSS. But what was our surprise on being told that these documents had already been sought for in vain at the request of Dr. Wohlwill, and that no one remembered to have seen them. Professor Berti will perhaps have the goodness to clear the matter up. The documents were probably only exact copies of Riccioli's text.

SENTENZA.

Noi Gasparo del titolo di S. Croce in Gierusalemme Borgia.
Fra Felice Centino del titolo di S. Anastasis, detto d'Ascoli.
Guido del titolo di S. Maria del Popolo Bentivoglio.
Fra Desiderio Scaglia del titolo di S. Carlo detto di Cremona.
Fra Antonio Barberina detto di S. Onofrio.
Laudiviò Zacchia del titolo di S. Pietro in Vincola detto di S. Sisto.
Berlingero del titolo di S. Agostino, Gessi. [Prete.
Fabricio del titolo di S. Lorenzo in pane e perna. Verospi, chiamato
Francesco di S. Lorenzo in Damaso Barberino, e
Martio di S. Maria Nuova Ginetti Diaconi.

Per la misericordia di Dio della S. R. E. Cardinali in tutta la repubblica cristiana contra l' eretica pravità Inquisitori Generali della S. Sede Apostolica specialmente deputati.

Essendo che tu Galileo, figliolo del qu. Vincenzo Galilei Fiorentino dell' età tua d' anni 70 fosti denonciato del 1615 in questo S. Officio, che tenessi come vera la falsa dottrina da molti insegnata, che il Sole sia centro del mondo et immobile, e che la terra si muova anco di moto diurno: Che avevi alcuni discepoli, a' quali insegnavi la medesima dottrina: Che circa l' istessa tenevi corrispondenza con alcuni Matematici di Germania: Che tu avevi dato alle stampe alcune lettere intitolate delle Macchie Solari, nelle quali spiegavi l' istessa dottrina, come vera: Et che all' obbiezioni, che alle volte ti venivano fatte, tolte dalla Sacra Scrittura rispondevi glossando detta Scrittura conforme al tuo senso. E successivamente fu presentata copia d' una scrittura sotto forma di lettera, quale si diceva essere stata scritta da te ad un tale già tuo discepolo, ed in essa seguendo la posizione di Copernico, si contengono varie proposizioni contro il vero senso, ed autorità della sacra Scrittura.

Volendo per ciò questo S. Tribunale provvedere al disordine ed al danno, che di quì proveniva, et andava crescendosi con pregiudizio della Santa

Fede; d' ordine di Nostro Signore, e degli Emin. Signori Cardinali di questa suprema, et universale Inquisizione, furono dalli Qualificatori Teologi qualificate le due proposizioni della stabilità del Sole e del moto della terra; cioè.

Che il Sole sia centro del Mondo, et immobile di moto locale, è proposizione assurda e falsa in filosofia, e formalmente eretica per essere espressamente contraria alla sacra Scrittura.

Che la terra non sia centro del mondo, nè immobile, ma che si move etiandio di moto diurno, è parimenti proposizione assurda, e falsa in filosofia, e considerata in teologia, ad minus erronea in fide.

Ma volendosi per allora proceder teco con benignità, fu decretato nella S. Congregazione tenuta avanti Nostro Signore à 25 Febbraro 1616. Che l' Eminentissimo Signor Cardinale Bellarmino ti ordinasse che tu dovessi onninamente lasciare la detta dottrina falsa, e ricusando tu di ciò fare, che dal Commissario del S. Uffizio ti dovesse esser fatto precetto di lasciar la detta dottrina, e che non potessi insegnarla ad altri, nè difenderla, nè trattarne; al qual precetto non acquietandoti, dovessi esser carcerato; et in esecuzione dell' istesso decreto, il giorno seguente nel Palazzo, et alla presenza del suddetto Eminentissimo Signore Cardinale Bellarmino, dopo essere stato dall' istesso Signor Cardinale benignamente avvisato et ammonito, ti fu dal Padre Commissario del Santo Uffizio di quel tempo fatto precetto, con notaro e testimonii, che onninamente dovessi lasciar la detta falsa opinione, e che nell' avvenire tu non la potessi, nè difendere, nè insegnare in qual si voglia modo, nè in voce, nè in scritto; et avendo tu promesso d' obbedire fosti licenziato.

Et acciocchè si togliesse affatto così perniciosa dottrina, e non andasse più oltre serpendo, in grave pregiudizio della cattolica verità, uscì decreto della Sacra Congregazione dell' Indice, col quale furono proibiti i libri, che trattano di tal dottrina, et essa dichiarata falsa, et onninamente contraria alla sacra e divina Scrittura.

Et essendo ultimamente comparso quà un libro stampato in Fiorenza l' anno prossimo passato, la cui inscrizione mostra che tu ne fossi l' autore, dicendo il titolo: *Dialogo di Galileo Galilei delli due massimi sistemi del Mondo, Tolemaico e Copernicano.* Et informata appresso la sacra Congregazione, che con l' impressione di detto libro ogni giorno più prendeva piede la falsa opinione del moto della terra, e stabilità del Sole; fu il detto libro diligentemente considerato, e in esso trovata apertamente la transgressione del suddetto precetto che ti fu fatto, avendo tu nel medesimo libro difesa la detta opinione già dannata, et in faccia tua per tale dichiarata, avvenga che tu in detto libro con varii raggiri ti studii di persuadere, che tu la lasci, come idecisa et espressamente probabile. Il che pure è errore gravissimo, non potendo in modo niuno essere probabile un' opinione dichiarata e definita per contraria alla Scrittura divina.

Che perciò d' ordine nostro fosti chiamato a questo Santo Uffizio, nel quale con tuo giuramento esaminato riconoscesti il libro come da te composto, e dato alle stampe. Confessasti, che dieci o dodici anni sono in

circa, dopo essersi fatto il precetto come sopra, cominciasti a scrivere detto libro. Che chiedesti la facoltà di stamparlo, senza, però significare a quelli che ti diedero simile facoltà, che tu avessi precetto di non tenere, difendere, nè insegnare in qualsivoglia modo tal dottrina.

Confessasti parimenti che la scrittura di detto libro è in più luoghi distesa in tal forma, che il lettore potrebbe formar concetto, che gli argomenti portati per la parte falsa fossero in tal guisa pronunciati, che più tosto per la loro efficacia fossero potenti a stringere, che facili ad esser sciolti; scusandoti d' esser incorso in errore tanto alieno, come dicesti, dalla tua intenzione, per aver scritto in Dialogo, e per la natural compiacenza, che ciascuno ha delle proprie sottigliezze, e del mostrarsi più arguto del comune degli uomini, in trovar, anco per le proposizioni false, ingegnosi et apparenti discorsi di prohabilità.

Et essendoti stato assegnato termine conveniente a far le tue difese producesti una fede scritta di mano dall' Eminentissimo signor Cardinale Bellarmino da te procurata come dicesti, per difenderti dalle calunnie de tuoi nemici, da' quali ti veniva opposto, che avevi abiurato, e fossi stato penitenziato dal santo Offizio. Nella qual fede si dice, che tu non avevi abiurato nè meno eri stato penitenziato, ma che ti era solo stata denunciata la dichiarazione fatta da Nostro Signore e pubblicata dalla santa Congregazione dell' Indice, nella quale si contiene, che la dottrina del moto della terra, e della stabilità del Sole sia contraria alle sacre Scritture, e però non si possa difendere, nè tenere; e che perciò non si facendo menzione in detta fede delle due particole del precetto, cioè *docere, et quovis modo* si deve credere che nel corso di quattordici o sedici anni, ne avessi perso ogni memoria; e che per questa stessa cagione avevi taciuto il precetto, quando chiedesti licenza di poter dare il libro alle stampe. E tutto questo dicevi non per scusar l' errore, ma perchè sia attribuito non a malizia, ma a vana ambizione. Ma da detta fede prodotta da tein tu a difesa restasti maggiormente aggravato, mentre dicendosi in essa, che detta opinione è contraria alla sacra Scrittura, hai nondimeno ardito di trattarne, di difenderla, e persuaderla probabile; nè ti suffraga la licenza da te artificiosamente, e callidamente estorta, non avendo notificato il precetto che avevi.

E parendo a noi, che non avevi detta intieramente la verità circa la tua intenzione, giudicassimo esser necessario venir contro di te al rigoroso esame, nel quale (senza però pregiudizio alcuno delle cose da te confessate, e contro di te dedotte come di sopra, circa la detta tua intenzione) rispondesti cattolicamente. Per tanto visti, et maturamente considerati i meriti di questa tua causa, con le suddette tue confessioni, e scuse, e quanto di ragione si doveva vedere e considerare, siamo venuti contro di te all' infrascritta difinitiva sentenza.

Invocato dunque il Santissimo Nome di Nostro Signore Gesù Cristo, e della sua gloriosissima Madre sempre Vergine Maria, per questa nostra difinitiva sentenza, la quale sedendo pro tribunali, di Conseglio e parere dei Reverendi Maestri di sacra Teologia, et Dottori dell' una e l' altra

legge nostri Consultori, proferiamo in questi scritti, nella causa e cause vertenti avanti di noi tra il Magnifico Carlo Sinceri dell' una e dell' altra legge Dottore, Procuratore fiscale di questo Santo Offizio per una parte, e te Galileo Galilei reo, quà presente processato, e confesso come sopra dall' altra. Diciamo, pronunciamo, sentenziamo, dichiariamo, che tu Galileo suddetto per le cose dedotte in processo, e da te confessate, come sopra, ti sei reso a questo Santo Offizio veementemente sospetto d' eresia, cioè d' aver creduto, e tenuto dottrina falsa, e contraria alle sacra, e divine Scritture, che il Sole sia centro della terra, e che non si muova da oriente ad occidente, e che la terra si muova, e non sia centro del mondo ; e che si possa tenere difendere per probabile una opinione dopo d' esser stata dichiarata, difinita per contraria alla sacra Scrittura ; e conseguentemente sei incorso in tutte le censure, e pene da' Sacri Canoni, et altre Constituzioni generali, et particolari, contro simili delinquenti imposte, e promulgate. Dalle quali siamo contenti, che sii assoluto, pur che prima con cuor sincero, et fede non finta avanti di noi abiuri, maledichi, et detesti li suddetti errori, et eresie, e qualunque altro errore, et eresia contraria alla cattolica et apostolica Romana Chiesa, nel modo che da noi ti sarà dato.

Et acciocchè questo tuo grave, e pernicioso errore, e transgressione non resti del tutto impunito, e sii più cauto nell' avvenire ; et esempio agli altri, che s' astenghino da simili delitti. Ordiniamo che per pubblico editto sia proibito il libro de' *Dialoghi di Galileo Galilei*.

Ti condanniamo al carcere formale di questo S. Offizio per tempo ad arbitrio nostro, e per penitenze salutari t' imponiamo, che per tre anni a venire dichi una volta la settimana li sette Salmi Penitenziali.

Riservando a noi facoltà di moderare, mutare, o levar in tutto o in parte le suddette pene, e penitenze.

E cosi diciamo, pronunciamo, sentenziamo, dichiariamo, ordiniamo, condenniamo, e riserviamo in questo, et in ogni altro miglior modo, e forma, che di ragione potemo, e dovemo.

Ita pronunciamus nos Cardinales infrascripti.

F. Cardinalis De Asculo.
G. Cardinalis Bentiuolus.
F. Cardinalis De Cremona.
Fr. Antonius Cardinalis S. Honuphrij.
B. Cardinalis Gypsius.
F. Cardinalis Verospius.
M. Cardinalis Ginettus.

ABJURA DI GALILEO.

Io Galileo Galilei figlio de q. Vincenzo Galilei da Fiorenza dell' età mia d' anni 70 constituito personalmente in judicio, et inginocchio avanti di voi Eminentissimi, e Reverendissimi Signori Cardinali in tutta la Christiana Republica contro l' heretica pravità Generali Inquisitori

havendo avanti gli occhi miei li Sacrosanti Evangeli, quali sono con le proprie mani, giuro che sempre ho creduto, credo adesso, e con l' aiuto di Dio crederò per l' avenire, tutto quello, che tiene, predica, et insegna la Santa Cattolica, et Apostoliça Romana Chiesa. Ma perche da questo S. Officio per haverio doppo d' essermi stato con precetto dall' istesso giuridicamente intimato, che omninamente dovessi lasciare la falsa opinione, Che il Sole sia centro del Mondo, et immobile, e che la terra non sia centro, e che si muova, e che non potessi tenere, difendere, ne insegnare in qual si voglia modo, ne in voce, ne in scritto la detta falsa dottrina, e dopò dessermi stato notificato, che detta dottrina è contraria alla Sacra scrittura, scritto, e dato alle stampe un libro nel quale tratto l' istessa dottrina già dannata et apporto ragioni con molta efficacia a favor d' essa, senza apportar alcuna solutione, son stato giudicato vehementemente sospetto d' heresia, cioè d' haver tenuto, e creduto, che il Solo sia centro del Mondo, et immobile, e che la terra non sia centro, e si muova.

Per tanto volendo io levare dalle menti dell' Eminenze Vostre, e d' ogni fedel Christiano, questa vehemente sospittione, contro di me ragionevolmente conceputa, con cuor sincero, e fede non finta, abiuro, maledico, e detesto li sudetti errori, et heresie, e generalmente ogni e qualunque altro errore, e setta contraria alla sudetta Santa Chiesa; E giuro che per l' avenire, non dirò mai più, ne asserirò in voce, ò in scritto cose tali, per le quali si possi haver di me simil sospittione; ma se conoscero alcuno heretico, ò che sia sospetto d' heresia lo denuntiarò à questo Santo Officio ò vero all' Inquisitore, et ordinario del luogo, ove me trovero.

Giuro anco, e promesso d' adempire, et ossevra re intieramente, tutte le penitenze, che mi sono state, ò mi saranno da questo Santo Officio imposte. Et contravenendo io ad alcuna delle dette mie promesse, proteste, ò giuramenti (il che Dio non voglia) mi sottopongo a tutte le pene, e castighi, che sono da Sacri Canoni, et altri Constitutioni Generali, e particolari contro simili delinquenti imposte, e promulgate; Cosi Dio m aiuti, e questi suoi santi Evangelij, che tocco con le proprie mani.

Io Galileo Galilei sopradetto ho abiurato, giurato, e promesso, e mi sono obligato come sopra, et in fede del vero di propria mia mano hò sottoscritto la presente Cedola di mia abiuratione, e recitata di parola in parola in Roma nel Convento della Minerva questo di 22 Giugno 1633.

Io Galileo Galilei hò abiurato come di sopra di mano propria.

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